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The Physiotherapy Review

Vol. IX No. 6

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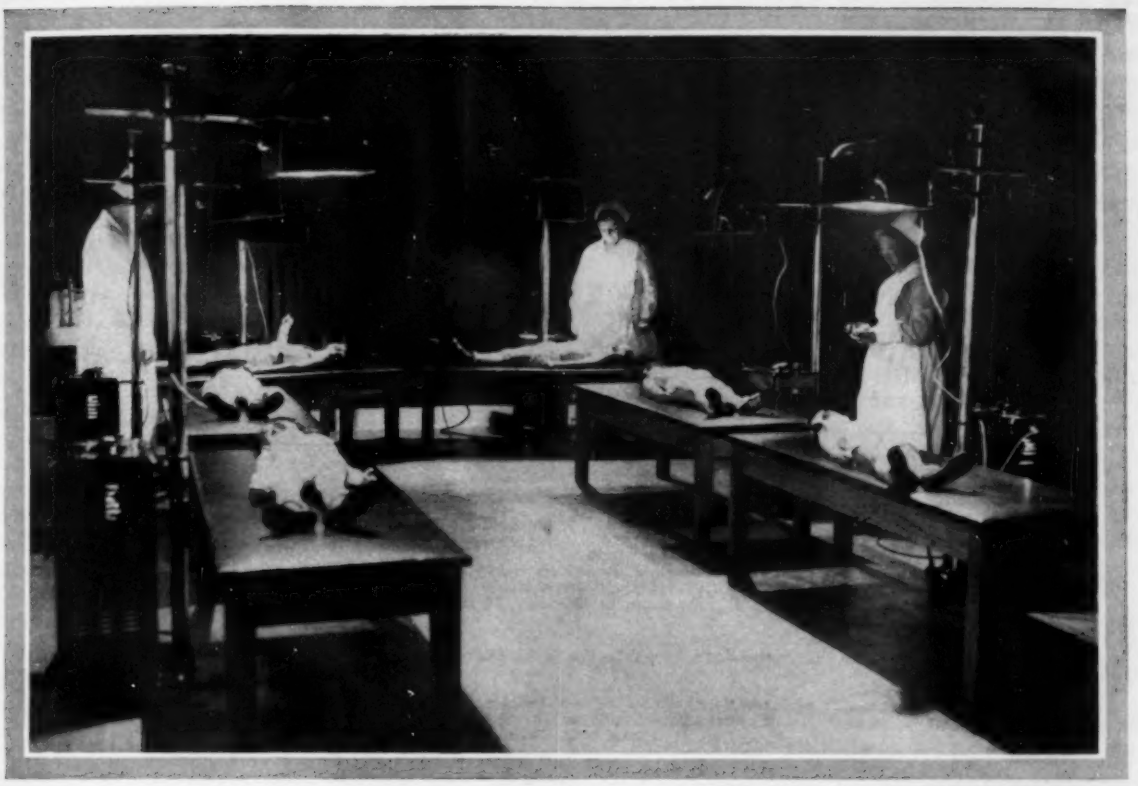

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The Romance of Physiotherapy

By Dr. Jas. W. McConnell, Neurologist and Consulting Psychiatrist to the Philadelphia General Hospital; Associate Neurologist to the Graduate School of the University of Pennsylvania; Associate Neurologist to the Graduate Hospital of Philadelphia; Consulting Neurologist to the Memorial Hospital, the Oncologic Hospital, the West Philadelphia Hospital for Women

A talk delivered to the Pennsylvania Physiotherapy Association

Many, many years ago, Solomon, the wisest man who ever lived, stated, "There is no new thing under the sun," and, as relates to some of the elements of Physiotherapy, the statements of the great king of Israel will be shown to be correct; however, no attempt will be made in this talk to give you, in chronological order, a list of the appearances or of the nomination of the therapeutic procedures or novel appliances for the healing of the sick and afflicted to which are given names such as systems, cults and isms; but an effort will be made to justify Solomon in his contention.

The term Physiotherapy, as generally used, refers to the use of the forces of nature in the treatment of disease, as differentiated from the employment of drugs for that purpose.

It is a very difficult thing to determine just when Physiotherapy was first utilized as a therapeutic agent, by whom it was employed, or what corner of the earth was honored by its inaugural. It is equally hard to say when drugs first took their place as a part of the armamentarium of those attempting to cure diseases. All these abstruse problems must be left to those delvers in the archaeologic sciences who have pleasure in such searchings, and attention will be called to the publication, not so long ago, in the Brooklyn "Eagle," of Brooklyn, N. Y., of a list of fifty-nine methods of medical practice and medical cures outside of drugs, not including osteopathy, chiropractic, new thought or unity. Additionally, this collection of pathies completely ignores the remedies of the old grandmothers and the jumbled advice of practical nurses, both of which lack only classification and advertising to be raised to the dignity of cults.

Modern Physiotherapy is, in almost every respect, a renascence of ancient methods and it can be distinctly proven that the procedures at present employed were utilized during ages of the world's history, not only what is known as sacred history but also that which is called profane. For centuries, dancing and music were evidences of pleasure. They produced mental reactions the opposite of depression and could not be indulged in except by those in good physical and mental health. Among many savage nations the healers of the sick employed noise producing instruments which were vigorously played with the intent of driving away the evil genii who had infested the afflicted one. Later, strains of a subdued, harmonious character were found to operate with equal success. Once upon a time, there was a famous king of Israel whose name was Saul. His soul was sick. Either as the result of the weight of

governmental burdens, or perhaps as the consequence of family cares, Saul became mentally depressed. He sought solitude, he refused to join in the festivities of his court and he ceased to behave as a normal human king should conduct himself. Variously he was treated by the physicians of his time and without results, until they called music to their aid. David, "the sweet singer of Israel," who, later, was to succeed Saul, was employed to play the harp, and, with his sweet music, to drive away the shades of melancholy that had seized his majesty. "David took a harp and played with his hand; so Saul was refreshed, and was well." So far as I know, this is the earliest recognition of the advantageous use of music in the treatment of mental diseases.

Aesculapius, the son of Apollo, regarded by the ancient Greeks and by physicians since then, as the god of medicine, was destroyed by a thunderbolt launched by Jupiter at the instigation of jealous Pluto, because he had become so proficient in the art of healing the sick and raising the dead that he "diminished the number of shades in Hades." Aesculapius had many followers or disciples who, following his death, caused the erection of temples of his cult to which were given the name oracles, of which the most famous was the one at Epidaurus, and at them the principles of treatment laid down by Aesculapius were carried out. Commonly their locations were on wooded hills or mountain sides near mineral springs, much like the health resorts of modern times. Sufferers who sought relief were treated by baths from the mineral springs, by rubbings, by inunctions, followed by strange semi-religious rites and by sleeping in the temples, all of which probably helped to increase the suggestibility of the patients' minds. Later, the complete recovery of the patient was brought about by catharsis, emesis, bloodletting.

One of the popular forms of treatment during the flourishing times of the Roman empire were the baths, called thermae, and used in their days for the restoration to health of sick senators, of wounded gladiators, of females whose hearts were broken by faithless beaus, and of aged lovers who thus strove to bring back the youth that had fled. The baths were commonly of two kinds, warm, called tepidaria, and the cold, known as frigidaria. History tells us that the Baths of Caracalla, and of Diocletian, were structures of surpassing beauty, constructed almost entirely of marble. They obtained their water supply from the great aqueducts and had accommodations for from 1,600 to 3,000 persons. Apparently there was little variation in the treatment of the different ills or injuries. The procedure consisted of immersion, followed by manipulations, by rubbings and by the anointings with essential oils and various aromatics.

When one considers the use of rubbings and manipulations, one must mentally go to countries the existence of which was perhaps unthought of by the followers of Aesculapius, and certainly not recognized by the attendants at the Roman baths. In far-off China, as far back as the time of Confucius, the Chinese medical man depended very largely for his professional success upon individuals who gave rubbings and manipulations under his directions. At this art history tells us they were extremely clever and in the practice of it the blind were especially well educated, trained and widely employed. It is not to be wondered at that their principles of therapeutics and the practice of them were accepted by their near neighbors, the Nipponese, and in records as early as 892 A. D., there are stories indicating the use of manipulation as a means of livelihood for those among the Japanese who were deprived of sight. Sydenham, one of the most distinguished of English physicians, and one of the earliest of the later medical fathers to believe in nature's remedies, most highly recommended bathing, the drinking of mineral waters and manipulations of various kinds as aids to the natural recuperative ability of the sick individual.

The use of lights of various colors dates back many centuries and probably had its origin, as had many other medical procedures, in certain religious beliefs. For instance, the Chinese and the ancient Maoris believed that evil spirits (disease) were driven away by red. Other peoples considered that color the source or origin of heat. Sometimes colors were supposed to be selective in function and purple hangings about the obstetric chair or the lying-in bed insured to the mother a male child. The Japanese used lights and hangings, preferably red, in the treatment of smallpox. Away back in the fourtenth century, one of the princes of England, a son of Edward II, was seriously ill with a loathsome disease, now known as smallpox. The physicians of the kingdom strove in vain to stay the progress of the affection but finding that impossible, bent their efforts toward the prevention of pitting and of scarring. Strangely, the method recommended for accomplishing this was that of the Chinese-Japanese, and the bed of the sufferer was surrounded with the red cloth hangings which were supposed to lower the temperature by drawing the red blood outward to the surface of the body, thereby renewing the skin and preventing the marking as the disease subsided.

In considering the romantic side of Physiotherapy, one does not have to confine the search to the countries of the east. In our own country, indisputable evidence has been found showing that the primitive Indians anticipated the methods of the present day and not infrequently made excellent use of the geysers, the hot springs and the sweat oven in the treatment of their physical infirmities. Near to a well-known seashore resort on the Atlantic Coast is a place once called Indian Springs, and legend has it that to this place in early summers came Indians from all parts of North America to be cured of various ills by the drinking of the waters or by being bathed in them.

It is most interesting to compare the methods of the present day with the means employed by the ancient Greeks, the Romans, the Chinese, the Indians and the others in the treatment of diseased conditions. As I said in the opening of this talk, Solomon said, "There is no new thing under the sun," and if one tabulates the therapeutic agents used by the ancients and by the moderns, the dictum of the wise one is certainly proven. The ancients prescribed baths and mineral springs while the moderns practice hydrotherapy. The manipulation of the Chinese and Japanese is now replaced by the more scientific massage. Actinotherapy is the new name for treatment with light; radiotherapy supplants heat. Modification of diet has been renamed dietotherapy and the rest methods of the Aesculapiadae have been supplanted by the ramifications of the Weir Mitchell rest cure. Isolation, music and diversion which played important roles in our ancestors' medical practice are pronounced less useful than the modern psychotherapy; exercise has been refined into medical gymnastics and common, ordinary work has become the valuable, abused, mental and physical uplifting, occupational therapy.

From Hippocrates to twentieth century medicine is a far cry, and the gentle voices of the custodians of the oracles of Epidaurus have slowly but surely increased in volume as their successors, the physiotherapists, have increased in numbers. These have spread abroad the gospels of the new and the still newer methods of treatment, keeping themselves, and those of us who are interested, wondering what will be the next therapeutic agency retrieved from the past, for surely we will have to repeat with Bertin, "There is nothing new except what is forgotten."

1930 Chestnut St., Philadelphia, Pa.

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Heat in Surgery

By Dr. A. Bruce Gill, Philadelphia

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Local application of heat produces relaxation of tissues, particularly of voluntary and involuntary muscle fibres, and it aids chemical activity or metabolism. Spasm of the skeletal is relieved and the arterial walls relax and the vessels dilate. By reason of both of these conditions, a greater amount of arterial blood flows to the part, bringing oxygen and food. The continued heat promotes oxidation, upon which depend the normal physiological and mechanical functions of the various parts and members of the body. The increased blood flow carries away the products of oxidation so that they do not remain as local poisons or irritants, but are excreted from the body through natural channels.

There are numerous conditions in various parts of the body where normal physiological activity or metabolism has been interfered with as a result of local injury or disease or as a part of a general slowing of metabolism throughout the entire body. If metabolism of the tissues becomes permanently lowered, the function of the member or part of the body becomes impaired. With lessened gross mechanical function of the part, there is lessened chemical or metabolic activity, because motion or function is a prime factor in the flow of the blood and in the oxidation of the tissues. Thus a vicious circle may become established.

As a result of local injury, there is hemorrhage, exudation, effusion, swelling, increased pressure or tension and pain. The increased tension narrows the lumen of the veins or completely occludes them, and it blocks the flow in the lymphatics. Greater swelling even of distal parts results. It is possible that as a result of the blocking of venous flow, capillary tension becomes so increased that the capillaries rupture. Anemia and even death of tissues ensues. Later, scar tissue forms and as it contracts it constricts blood vessels, interferes with function of nerve, and grossly interferes with the mechanical function of the member by limiting or abolishing motion of muscles and their tendons and of joints through fibrosis of ligaments and capsule or by adhesions within the joint. Immediately following an injury there is an inflammatory reaction with heightened metabolism and elevation of temperature. This condition is to be treated by rest, elevation, and application of cooling lotions. But the succeeding subacute and chronic stages, with swelling, sluggishness, anemia and lowering of metabolism, are to be treated by application of heat, massage, and passive and active motions carried out in a manner to avoid repetition of traumatism of the structures already injured. To speed up a lowered metabolism, to remove the products of hemorrhage and exudates into the tissues, or effusions into the joints, to restore chemical and mechanical function, are the objects of our treatment.

In the following conditions the application of heat followed by massage may be of value.

Traumatic Conditions

1. *Fractures.* A simple fracture of the shaft of a long bone not involving a joint or near a joint and not complicated by a marked or persistent swelling at the site of the fracture or of the extremity distal to the fracture may not require this form of treatment. But fractures into or about the joints such as Colles' fracture, or Pott's fracture, accompanied by swelling at the site of the fracture and particularly by swelling of the hand or foot, are best treated by baking, followed by massage. This treatment should be begun within a few days after reduction of the fracture. Care may easily be taken not to displace the fragments during the treatment. It is of the utmost importance to prevent fibrous ankylosis of the fingers, which is caused in large part or altogether by persistent swelling of the hand. Such persistent swelling of the hand may occur as a result of any severe traumatism to the upper extremity, whether a fracture or a dislocation. It is to be combated by attention to the dressing to prevent interference with the circulation, by elevation of the hand, by persistent active movement of the fingers, and by baking and massage.

Function of the joints of both the upper and lower extremities should never be lost sight of in dealing with any fracture of the extremities. Baking, massage, passive and active movements are the chief means at our command for the maintenance or restoration of normal motion. Treatment should be continued for as long as swelling and limitation of motion persists, or as long as there is tenderness at the site of the fracture.

2. *Sprains and Dislocations.* Treatment is very similar to that of fractures near joints as just described. Splints or casts should be removed and replaced again after the daily treatment by baking and massage. On the whole, fixation by a removable plaster splint and daily baking and massage are to be preferred to strapping with adhesive plaster which does not permit of the Physiotherapy.

3. *Traumatic Synovitis.* After the first stage of acute inflammation, lasting from one day to possibly a week, the secondary stage of absorption of effusion and restoration of function to the joint begins. During this stage baking and massage are vitally important in aiding these processes.

4. *Contusions and Muscle Sprains.* Similar means of treatment are valuable also in these conditions to secure absorption of products of hemorrhage and to eliminate swelling and pain and secure restoration of function. Collection of blood, if not absorbed, may form cysts or may be infected through the blood stream and become abscesses. The development of such abscesses after local injury are not uncommon. It is of importance to secure as early absorption of blood clots as possible. Treatment should be continued as long as tenderness in the injured part persists.

5. *Bursitis,* as often seen about the elbow and shoulder joints, for example, resulting from acute or chronic strain, are susceptible to improvement or cure by baking and massage.

Inflammatory Conditions

During the acute stage of inflammatory conditions of joints and bursae, the application of heat is more harmful than beneficial. The duration of the primary stage depends very largely, of course, on the kind and the virulence of infection. An infection of a joint may produce a simple synovitis, a plastic arthritis, or a severe, purulent arthritis, and the course and duration of the disease vary tremendously. In general it may be said

that for these conditions baking and massage are to be begun after the acute inflammatory reaction has disappeared. The object of the treatment is then to remove the products of inflammation such as effusion into the joint or exudate in the tissues about it; and in the second place to aid in the removal probably of fibrous tissue formation which limits joint motion; and, finally, to loosen all muscles or tendons which move the joint and which are bound by adhesions within the sheath or outside the sheath or in the bursae which permit muscle movements. Even in fairly severe cases of fibrous ankylosis, some benefit is to be obtained by this method of treatment, while in the milder cases we may expect even complete restoration of function in the joint. Before doing any operation on or about such a joint, the surgeon should employ baking and massage persistently and faithfully for some weeks or months to secure as much improvement as possible.

Semirigid and spastic flat feet due to traumatism or to infection possibly can ofttimes be made more flexible by these means of Physiotherapy in addition to the use of proper supports for the feet.

CHRONIC BACKACHE

A complete discussion of this subject would occupy many pages. There are probably many causes for chronic backache and the treatment must vary according to the etiology, but by far the largest percentage of cases are probably those due to muscle and ligamentous strain, either arising acutely from some traumatism or occurring slowly from a chronic strain, such as that due to bad posture. The site of the trouble may be about the lumbosacral joint or very occasionally the sacroiliac joint, but it is most commonly found in the lumbar region of the back, where the points of tenderness are found to be at the tips of the lumbar transverse processes where the lumbar muscles, particularly the quadratus lumborum, are attached. I am accustomed to treat this condition by baking and massage, by proper means of support for the muscles and ligaments which are under strain, and by properly graded exercises to strengthen the muscles and to improve posture. Acute attacks of what might be called myositis or lumbago are also best treated by baking and massage, and by a support, or by complete rest in bed for the time being.

CHRONIC ARTHRITIS

1. *Multiple Infectious Arthritis.* This disease, which affects both children and adults, begins more or less acutely in the joints, with swelling, pain, redness, elevation of local temperature about the joints. After the acute symptoms have subsided, baking and massage are useful and are to be employed to eliminate the swelling which remains, and to secure better motion or to prevent ankylosis and deformities.

2. *Atrophic Arthritis.* Baking and massage locally are of very great importance in treating this condition. It lessens the swelling and pain, it increases the range of motion, and diminishes at times the amount of crepitation which can be felt and heard in the affected joint.

3. *Hypertrophic Arthritis.* Application of heat probably has no appreciable effect on the bony changes which have taken place in and about the joint, but it lessens the tenderness and pain and the stiffness from which the patient suffers. This makes him more comfortable.

METHODS OF APPLICATION OF HEAT

Heat may be applied by means of hot fomentations, by application of hot water bottles and electric pads, but the best means of application is by baking of the part. Various types of apparatus may be used, viz., the baker which contains numerous electric light bulbs or an electric or gas baker. The temperature in the baker may be raised to a temperature of between 200 and 400 degrees. The higher the temperature employed, the greater care must be used to keep the skin covered with layers of flannel or woolen blankets to avoid blistering. The length of each treatment is usually about one half hour. Following the baking, a thorough massage should be given. The parts should then be kept warm and not cooled off rapidly by going out into the cold immediately after treatment.

Nervous Diseases in the Occupation and Life of the Adult

By W. B. Cadwalader, M.D.

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Since the subject assigned to me by your program committee for discussion tonight covers such a large field of medical science, I shall be compelled to allude only to a few of the more general aspects of the diseases that affect the nervous system in adult life.

It seems at once necessary to begin by emphasizing certain fundamental conceptions regarding the structure of the brain and spinal cord; for by having in mind these basic principles, logical thought can be more easily developed while attempting to clarify a subject so difficult to discuss briefly.

The central nervous system contains millions upon millions of nerve cells connected with each other by innumerable branchings of their separate processes. They are nourished by blood conveyed to them through blood vessels, and are surrounded by a specialized form of connective tissue known as neuroglia tissue. Each of these different forms of tissue may be affected separately, or collectively.

Dr. Donaldson, and his staff, at the Wistar Institute of Anatomy in Philadelphia, have estimated by their exact methods of investigation that the brain alone contains 13,000,000,000 nerve cells. This very complexity of structure at once suggests an equal complexity of function, a fact only too well known to us all. Moreover, it is generally recognized that the number of nerve cells in the brain is fixed at birth, and that most of them persist through life. Heredity probably determines their number. But nutrition before birth and continued adequately through life is the most important single factor influencing the growth of neurons and their capacity for increasing function by education, training, and experience.

Different investigators at different times have systematically studied the brains of great scholars, hoping to find some structural characteristics that might assist in explaining superior intellectual attainments; but conclusions from these studies alone are scarcely justified. Different degrees of intellect in normal subjects cannot yet be attributed to any demonstrable differences in structure; nevertheless, it is interesting to know that Dr. Donaldson has very recently completed examinations of the brains of three eminent men. One of them was that of Sir William Osler. In each of these brains the frontal and occipital areas were found relatively better developed than usual. This has been interpreted as the result of some more favorable nutritional conditions, and these conditions are regarded as important physiological factors favoring superior intellectual performances of these three distinguished men.

Other observations indicate that in brains from persons of outstanding ability the arterial supply is much more elaborate and better developed than in brains of persons of restricted abilities.

From all these facts one can conclude with confidence that man's normal nervous activities are dependent upon the structural and functional integrity of the whole nervous system, and that his highest activities are especially dependent upon the cerebral hemispheres.

It follows, therefore, that whenever nerve cells degenerate, whatever the cause, diminution of function or imperfect function must result, the manifestations of which are recognized as the signs and symptoms of disease.

From this very general point of view has evolved the broad classification of organic and functional diseases of the nervous system. In the latter group are included the psychoneuroses, conditions that are not attributed to destruction of the elementary structures of the brain.

The clinical differentiation between organic and functional disease of the nervous system is in my opinion one of the most difficult problems a neurologist has to contend with, because in many cases the symptoms of functional disease may appear as counterfeits of those produced by organic disease.

I have just said that it was generally believed that in man most nerve cells persist through life—in general this is true, unless their number is diminished by disease, but in 1920 Ellis demonstrated that in normal individuals progressive disintegration and disappearance of the cells of Purkinje in the cerebellum occurred, a phenomenon dependent solely upon advancing years. This observation has been confirmed at the Wistar Institute of Anatomy. Purkinje cells begin to disappear as early as the twenty-second or twenty-fifth year of life. Pathologists are inclined to explain this loss to extrinsic causes, but other authorities put the emphasis on continued activity leading to exhaustion. Whatever the cause, the effect is to modify the normal and complete cerebellar control of muscular movements at an early age.

In different occupations requiring precision of coordinated muscular movements, individuals become less efficient during advancing years of life, as in watchmakers, and especially in those occupations requiring precision of muscular control in relation to the maintenance of equilibrium, such as lofters, steeple jacks, bridge builders, etc. In these occupations it is generally conceded that youth has the advantage.

The muscular atrophies of spinal origin are dependent upon degeneration of the cells in the anterior horns of the spinal cord. The symptoms appear in early adult life. Examples of intense muscular atrophy are sometimes exhibited in the side shows of a circus, as the so-called "Living Skeleton." The exact cause of the condition is unknown, but Sir William Gowers classed these diseases under the general term abiotrophy, a name coined by him to indicate an inherent lack of vitality of the cells of the spinal cord, owing to which they become incapable of withstanding the stress of advancing years, and consequently undergo degeneration at a relatively early period of life. Though occupation has no direct bearing on the development of this condition, atrophy sometimes appears first in muscles of the right upper limb in right-handed individuals, indicating, therefore, that muscles that are most used are more susceptible during the period of onset of the disease.

There are other examples of disease in which the symptoms do not appear until adult life, yet are dependent upon abnormalities of development that exist from birth. For example syringomyelia rarely develops before the thirtieth or more generally the fortieth year, yet the accumulation of evidence tends to show that the alterations

of the glia tissue which are responsible for the symptoms are congenital in origin, but for reasons not yet clear do not progress sufficiently to produce symptoms till the period of middle adult life is reached. A process somewhat similar seems to be responsible for the development of tumors, especially the gliomatous tumors of the brain. These particular types of tumors originate from embryonal types of cells that are thought to exist in the brain from birth without causing disturbances of any kind until certain conditions arise, as yet unknown, which stimulate them to rapid prolification resulting in tumor formation.

Of the diseases acquired in adult life, there is no condition more prevalent at the present time than chronic epidemic encephalitis and the Parkinsonian syndrome.

The development of epidemic encephalitis during the epidemic of "flu" in 1917 suggested an intimate relationship between the two conditions. Since then much research work has been done on the subject, yet the exact nature of this infection is still unsettled. There are certain reasons for believing that epidemic encephalitis is not a manifestation of "flu" but is probably an independent and separate disease. It has become firmly established, however, that the Parkinsonian syndrome does not develop unless the inflammatory lesions affect that part of the brain known as the striate bodies. Ocular paralyses are extremely characteristic of this condition owing to the fact that the cells of the oculomotor nuclei are implicated simultaneously, and especially the group of cells situated in the more caudal levels of the oculomotor nuclei, which is known as the nucleus of Perlia, which, when affected, is responsible for paralysis of convergence. This form of ocular paralysis is especially characteristic of the Parkinsonian syndrome. It may be present when other signs of the disease are so inconspicuous that the diagnosis may be in doubt. Other curious phenomena have been observed in this disease, some of which have been erroneously regarded as manifestations of hysteria, as, for example, attacks of involuntary closure of the eyelids, which may persist long enough to be disabling. I have known more than one patient who would hesitate to cross the street alone because of the possibility of his eyes suddenly closing in spasm while walking in the midst of moving traffic. The general fixity of expression and slowness of movement of Parkinsonian patients are very apparent even to the casual observer. Kinnier Wilson has alluded to this essential distinguishing feature of the disease as "poverty movement."

The effect of trauma upon the nervous system is likewise an important subject for consideration. The immediate results of an injury to the head are generally obvious, and quickly appreciated, but the late effects, and the consequences, are not so easily estimated.

The minds of many physicians have been imbued with an exaggerated importance of fractures of the skull to the detriment of a proper appreciation of the subject, namely the functional or organic damage that the brain has suffered. Intracranial hemorrhages, both large and small, occur without fracture of the skull. Sometimes hemorrhage accumulates very slowly, so that symptoms are delayed and do not appear until weeks have elapsed, not only after the immediate effects of injury of the skull have subsided, but during the period when the patient may be regarded as having recovered. Because of this delay in development of symptoms, the etiological connection of previous trauma is not always fully recognized. Cases of this kind occur in which the proper evaluation of these facts may lead to successful operation, and relief of the symptoms in spite of negative X-ray examinations. In most severe traumata to the head there are definite disturbances of the cerebral functions. This is obvious whenever consciousness is lost. Not infrequently minute punctate hemorrhages occur throughout the brain substance as the result of contusion, or concussion, eventually leading to equally minute areas of tissue destruction, which are probably responsible for the subsequent development of alterations of personality that tend to be permanent, as evidenced by general lack of initiative, diminished capacity for intellectual and physical work, and rapid fatigue after exertion. Many such cases are classified as post-traumatic neuroses.

Dr. Martland, of Newark, has recently called attention to a peculiar condition occurring among prize fighters, which in ring parlance is spoken of as "Punch Drunk." "Fighters in whom the early symptoms are well recognized are said by the fans to be 'Cuckoo,' 'Goofy,' 'Cutting Paper Dolls,' 'Punch Drunk' most often affects fighters of the slugging type, who are usually poor boxers, and who take considerable head punishment, seeking only to land a knockout blow. Frequently one to two hours are required to recover from a severe blow to the head or jaw. In some cases, consciousness is lost for a considerable period of time. The early symptoms of 'Punch Drunk' usually appear in the extremities. There may be an occasional slight flopping of one foot, or leg, in walking, noticeable only at intervals, or a slight unsteadiness in gait, and slight mental confusion, as well as a distinct slowing of muscular action. Many cases remain mild in nature, and do not progress beyond this point, but in others distinct dragging of the leg may develop, associated with a peculiar mental attitude characterized by hesitancy in speech, tremors of the hands, and nodding movements of the head. In more severe cases there may subsequently develop a staggering, propulsive gait with the facial characteristics of the Parkinsonian syndrome, and finally marked mental deterioration may set in, necessitating commitment to a hospital. This condition does not seem to have been described in medical literature, and the exact mechanism which is responsible for these symptoms is still a matter of conjecture, but it seems most probable that definite injury of brain must occur from concussion sustained by repeated blows on the head, or jaw, resulting in minute hemorrhages in the deeper portion of the cerebrum, not unlike, therefore, the effects of other forms of injury."

It is conceivable that in any severe cranial injury, unassociated with fracture of the skull, hemorrhages may be fewer, and not in such vital situations as in the fatal cases. If these facts can be established, and I think they can, they are of enormous value to the courts and to labor compensation companies in placing many cranial injuries on a firm pathological basis. But it also will have its advantages, for a great field will then be opened to malingerers suffering from various forms of psychoses and neuroses claiming undue compensation. The correct diagnosis during life will always be extremely difficult, as the condition can only be proven by autopsy.

Under the general term occupation neuroses are classed a great variety of disturbances of muscular function, which are in some way dependent upon fatigue. They seem to develop more frequently in individuals with a general neurasthenic disposition. By an occupation neurosis is understood a disturbance of innervation of the muscles occurring only in certain complicated movements, acquired by practice, of such a nature as to permit the same muscles to respond to the will in all other actions; thus in a typical case, such as writer's cramp, the muscles paralyzed for the purpose of writing

are found to be entirely mobile for other purposes. Since occupation neuroses are conditions arising from special occupations they might better be termed vocational neuroses; yet, neurosis is not a good term, since it suggests a purely psychical origin, which is not the case. The important distinguishing feature of an occupation neurosis lies in the fact that certain muscles utilizable for all sorts of other purposes can not longer be used for a special technical purpose in one particular manner learned by practice. They are disturbances of acquired function, and as a rule of some highly specialized function. There are different theories as to the origin of these conditions, none of which are entirely satisfactory, but it is probable that the cells innervating the muscles concerned in a given case become exhausted, because of the frequency with which impulses are conveyed to them during a period of many years.

So many different types are known that it is impossible to enumerate them all. Writer's cramp is perhaps the best known. Sometimes these disturbances of muscular function are associated with cramps of the muscles and neuralgia, as in pianists, tailors, telegraphers, compositors, typewriters, violinists, and so forth. The diagnosis must always depend on a careful description of the onset of the condition in relation to the effects of the particular occupation.

Contemporary medicine distinguishes between "nervous" and "psychic" disturbances, that is to say, neuroses and psychoses, but this distinction is only an arbitrary one; no real line of demarcation can be drawn between these groups. It seems almost impossible to imagine abnormalities of the higher intellectual faculties without a functional or structural disturbance of cerebral cortex. The distinction between nervous and psychic affections is made on the grounds of greater or smaller complexities in the disturbances of nervous activity. Pathological disturbances result from violent changes in conditions of life, examples of which are best known in the form of neuroses developing during a great catastrophe; many cases were seen in the armies during the World War. In everyday life the conditions productive of extreme excitation and extreme grief may be factors in the production of mental disturbances, particularly when the natural actions are inhibited by the necessary restraint. Such conditions may lead to profound and prolonged disturbances of psychic activity. The psychological basis of neuroses may be regarded as an elaboration, with endless variations, of one central theme—"escape from an intolerable situation in real life to one made tolerable by the neuroses." Either a function is lost, the absence of which releases the patient from the intolerable situation, or one is lost which interferes with successful adaptation. The function may be mental or physical.

Too often physicians are inclined to regard hysteria as a phase of malingering; the distinction, however, though difficult, is definite. Difficulties arise from the fact that both a condition and a symptom are assembled together—as Bonnal says, "The hysteric is a malingerer who does not lie. The cardinal point of difference is that the malingerer simulates a disease or a symptom which he has not in order to deceive others. He does this consciously to attain, through fraud, a specific selfish end—usually safety in a hospital or, during war, discharge from military service. He lies and he knows that he lies. The hysteric deceives himself by a mechanism of which he is unaware and which is beyond his power consciously to control. He is usually not aware of the precise purpose which his illness serves. This is shown by the fact that, in many cases, all that is necessary for recovery is to demonstrate clearly to the patient the mechanism by which his disability occurred and the end to which, unconsciously, it was directed."

Different definitions have been offered to explain hysteria. Janet called it "A Dissociation of Personality," but the most useful and helpful explanation, I think, is the one given by Babinski, in which he said that hysteria was "a mental state, the stigmata of which, meaning paralysis and anesthesia, etc., are caused by suggestion, and are curable by persuasion." He was able to show that anæthesias were never found in patients who had not been previously examined by physicians. Soques demonstrated that when anæsthesia was present it was usually found on the patient's left side. He proved that this was owing to the fact that the sensory examination had been made by a physician who was right-handed and, while facing his patient, had tested the patient's left side first, a natural procedure when the examiner is right-handed. By this means anæsthetic areas had been produced by suggestion.

There are many forms of suggestion, but speech is the most powerful. To a patient the dominating forms of suggestion are the utterances of a physician.

Range of Bodily Movements

By Leonard D. Frescoln, A.B., M.D., Lecturer in Kinesiology, University of Pennsylvania, Philadelphia, Pa.

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It is an interesting fact that in examining patients it is a common practice to try to observe what conditions are present without reference to normal comparisons. Perhaps one reason for this is because of the wide variations of what is called "normal." While what is normal for one may not be for another, by investigating a large number of individuals an average normal can be reached.

This knowledge of the usual condition of affairs for ready reference and comparison is very useful in examining the movements of the human body. There should be possessed a general idea of the range of motion of the separate joints in the various directions; also a notion of how much force a given muscle should be able to exert; how responsive a set of muscles should be to a given impulse; what should be the proportionate size of different parts. Knowing these things we can estimate how much impaired a part may be, what is likely to be the trouble, and how it can best be remedied.

Let us look at the various joint systems and get a general idea of how they should function, making allowance for general contour and development. Movements about the shoulder, as in other parts generally, consist for the most part, in flexion, extension, abduction, adduction, internal rotation, external rotation, elevation, depression and circumduction combination—clockwise and anticlockwise. In this particular region we have movements taking place through a sliding and rotary motion of the scapula, together with a rather wide range in the ball and socket arrangement of the head of humerus articulating with the glenoid fossa of the scapula, or shoulder joint proper. Flexion through the latter takes place for about 110 degrees and then a forward rotation and gliding to allow the arm to come straight up—pectoralis maj. (ex. ant. thoracic n.), ant. del., coraco-bra.; then upper ser. mag. Abduction of arm is for first forty-five degrees by middle deltoid fibers and supraspinatus (largely circumflex n.), scapula being held by trapezius; if brought forward when raised to horizontal by the lower serratus fibers, the movement is through ant. deltoid and pectoralis major. The last forty-five degrees of abduction straight up is through scapular movements brought about by contraction of the trapezius as a whole, assisted by deltoid. Extension should be about fifty degrees largely through teres major, and when the arm is in position of about forty-five degrees abduction—the latissimus dorsi. As the arm comes down it is depressed or adducted to the body through the 180 degrees by its own weight and forcibly by the folds of the axilla, the rhomboids and pectoralis minor largely coming into play after forty-five degrees have been covered. Of course if the side of the trunk is avoided the pec. maj., and coraco-brachialis can adduct in front about forty-five degrees more. When the arm is brought back from the horizontal (latissimus) about thirty degrees, the pectorals are put on the stretch and made tense. Rotation takes place normally through ninety degrees (fifty degrees internal and forty degrees external). Circumduction is possible starting about forty-five degrees in front of chest. Shrugging of shoulder, through lev. ang. scap. and upper trapezius (and lower in forcibly depressing), moves the scapula through about nine cm. The scapulae are generally each 4.5 cm. from the spine or mid-axis and move over the ribs for nine cm. and rotate fifty to sixty degrees.

The elbow (hinge) joint should permit of 115 degrees to 145 degrees of flexion of the forearm upon the arm (as measured, e.g., by a goniometer). Extension is merely the reverse, the triceps opposing the biceps, etc. However, a person with a very large biceps will find it in the way when flexing far the forearm. The other movements in this locality are external rotation (supination) and internal rotation (pronation) through an arc of ninety degrees each at least, in the average person.

At the wrist there is permitted sixty degrees to ninety degrees of flexion and forty-five degrees extension; also forty-five degrees adduction (hand in supination) and forty degrees abduction in most people; this abduction is brought about by the conjoined action of flexor carpi radialis and extensors carpi radialis longior et brevior with the hand steadied by flexors and extensors; likewise the muscles on ulnar side adduct. There is adduction of thumb through forty-five degrees and abduction through eigthy degrees or a little more.

The fingers should be able to flex ninety degrees, and the toes a little less. The fingers also have the power normally to abduct and adduct about forty-five degrees through the interossei under ulnar control.

The hip (a peculiar ball and socket joint) naturally has a range of flexion (and some extension) amounting to 145 degrees, or little over ninety degrees, if leg is extended on thigh. Of course here again fat abdomens and muscular thighs interfere with this range. There is abduction of not much over forty-five degrees while body is held erect, and almost this far in post mid-line, if front of other lower extremity. Internal rotation of thigh amounts to forty-five degrees and external rotation fifty degrees. Rotation brings the top of head back when toes go in and great trochanter forward. The pelvic outlet is fifty degrees to the horizontal and this is lessened by straightening out the normal lumbar lordosis. The body may be flexed at hips with legs extended to over a right angle, and then hyperextended a few degrees. Lateral bending to forty-five degrees occur, and rotation to ninety degrees—head 130 degrees or more.

The knee joint, a shallow hinge joint with some lateral motion, permits generally 135 degrees of flexion from the straight line. When flexed at a right angle there may be a rotation of about thirty degrees or more each way.

The ankle has a range through seventy-five degrees i.e., thirty degrees flexion (dorsi-flex) and forty-five degrees of extension (plantar flexion), or from 135 degrees to sixty degrees. There is adduction (front of foot) of forty-five degrees as a rule and abduction of fifty degrees; pronation or turning sole out only about fifty, and supination, or sole rotated in, of forty-five degrees.

The ribs are raised in front about forty degrees in deep inspiration; and then lowered.

Besides the physiologic reasons for more or less interference with the free movements, as noted above, a

great many pathologic processes limit free movements and wide range; arthritides, osteomyelitis and epiphysitis, exostoses and tumors, sprains of soft tissues, dislocated and diseased cartilages, luxations, fractures (especially near to or involving joints), synovitis, hematomas and scurvy, bursitis, calcified bursa, calcification in muscles, strains, myalgia, neuritis and paralysis (I. P., Charcot joint, contractures, etc.), occasionally aneurisms and general debilitating conditions. The degree of impairment ranges from that hardly perceptible to a complete bony ankylosis.

The attempt to restore motion depends upon the knowledge had of handling the above pathological states, whether in the way of dispelling inflammatory processes by restoring to thorough baking, massage, active and passive movements, high frequency, diathermy, etc., or administering specific remedies, resting by splints, operating, retraining and rebuilding. It is well always to look for some local offending disorder that indirectly causes the trouble, and then correct this. Moving our members is a vital part of our existence and it is well to try to prevent troubles and seek to move about from the end of our first year to as long and as freely as we can.

BOOK REVIEW

Anatomy and Drawing, by Victor Perard, Art Instructor, Cooper Union, New York City, and Lecturer on Anatomy; Graduate of the Ecole Des Beaux-Arts, Paris; The National Academy of Design and The Art Students' League, N. Y.; Painter and Illustrator. Published by Victor Perard, New York.

The Study of Anatomy by Picture Reading. This book presents the subject of anatomy in a graphic form by over ONE THOUSAND ILLUSTRATIONS which give the origin and insertion of muscles, give their effects on the outer forms in actions, and which show the bones in many different positions.

A valuable and accurate reference book to have at hand. It will save reading many pages of technical text.

The Place of Manipulation and Corrective Gymnastics in Treatment

By R. Tait McKenzie, Philadelphia, Pa.

Presented before the joint meeting of the California Association of Physiotherapists and the American Physiotheraphy Association, San Francisco, June, 1923.

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I think this meeting is to be congratulated on two things: First, that Physiotherapy has now become a definite part of the medical profession by being made a section of the medical society of the state. And that is very significant. We are to be congratulated, also, on having had a man like Goldthwaite, who has devoted such a long period of his life to the study of the physiology and the anatomy of posture, to give us such an inspiring and illuminating address as he has this afternoon. Much of the pioneer work in Physiotherapy has, unfortunately, come from outside the profession, and we have been slow—too slow—to adopt many of the means of treatment well known to those whose only training has been empirical.

Let me mention two names only: Hugh Owen Thomas of Liverpool was a bone-setter, and from the very beginning of time there have been men who have discovered and successfully practiced the manipulation of joints for the correction of certain morbid conditions because they have acquired that almost instinctive feeling for the breaking down of an adhesion, or for the correction of a misplacement. Fortunately, in the case of Hugh Owen Thomas, this information which he acquired was passed on into good hands, passed on into the hands of Robert Jones, now Sir Robert Jones, his nephew, who, educated and qualified as a surgeon, put into practice many of the things which were taught him empirically by his uncle.

Let us take an example. It is a fact that, after certain injuries of the knee, wrenches or sprains, which have been ƒ 't up in a splint with the knee straight, there is an imperfect recovery, and that the knee remains painful and more or less stiff. Thomas discovered that, if you take a knee in that condition and bend it to a right angle, and then give it a sharp twist, something cracks and the patient gets immediate relief. What happens? Adhesions that had been formed by keeping the knee in a fixed position for a long time were stretched or torn by this simple manipulation, because, when the knee is flexed at a right angle, it is in the most favorable position for rotation. By that manipulation alone he frequently got most striking recovery of function and relief of wearing pain.

Take another instance. It is familiar to all of us who have had to do with injuries about the ankle, to see the ankle maltreated in the examination. Very often the surgeon will flex, extend, and twist it in a more or less aimless way, discovering pains in certain movements and finding that in certain positions there is no pain. But too often he does not analyze the exact reason of the pain. He finds, for example, that if the ankle is extended it is painful, and that if it is flexed it can be moved very freely, without very much pain. Now, if, instead of pump-handling the joint, or without waiting to get an X-ray, he would carefully examine the attachments of the external lateral ligament, place his finger on the attachment of the anterior fasciculus, or the posterior fasciculus, he would, in a great many cases, be able to make an absolute diagnosis. And then if, in a purely mechanical, common sense way, the ankle is so strapped that the injured fasciculus cannot be overstretched, there is no reason at all why the joint should not be kept in movement in all other directions, from the very first.

That is also true of the wrist. Most Colles' fractures are due, not to pure accident, but to carelessness or physical ignorance of the fine art of falling. When one has to fall, if fall one must, do not put the arm out straight and fall upon the wrist in that position (indicating). Do not persist in putting up the wrist in such a way that adhesions can become firmly established about the injured capsule and tendon sheaths and thus cause the greatest amount of deformity and the slowest rate of recovery. If we put the wrist in this flexed position and hold it down by a splint, you will be unable to exercise your flexors. If you try from this position to close your fist, you will see that it is practically impossible. If, however, you put it up in this extended position, and then try to close the fist, the flexors will be found to act almost automatically and can be used practically from the first. If the joint is put up in bad position with the fingers straight, it is impossible to have a quick recovery, because, after the splint is removed, you have to break down the adhesions that are formed during that period of quiescence, that have formed when the tendons are in the worst possible position, and you get a very slow and imperfect return to the normal. If, however, you put it up in the extended position and allow free movements of the fingers from the first, you do not get the adhesions forming at all, or if they do form they are very easily stretched.

It is an interesting experience to feel under the fingers the sensation of a tearing adhesion. An adhesion of a few days' formation will tear almost like blotting paper. It is a very soft feeling that you get. When it is a little older, it is a rougher, grating feeling; but an old adhesion very often snaps with a very distinct crack.

Another bone-setter of great ability was Wharton Hood, and he passed on the information that he had gained in the practice of his art to Frank Roemer, who wrote a book on modern bone-setting for the medical profession, which would do us all good to read, because he explains the contribution that they have made, and shows the reasons for their success.

I could go on with other joints like the shoulder and the elbow, but this will, I think, suffice to show what I mean.

During the war we came across a great mass of cases that crowded our hospitals suffering from deep, lacerated scars. They came in throughout the entire war, particularly in its first years. Some of these wounds were terrible to see, and sometimes a scar which was com-

paratively small upon the surface had its tentacles spread through the tissues underneath, strangling vessels and pinching nerves, causing acute pain, lowering the circulation, and involving muscle, tendon and bone in a way which was most deplorable in its results. It was for cases of this kind that we felt the urgent need of Physiotherapy and that the organized bodies of physiotherapists, both in England and America, made their place. These cases were first of all treated for pain by the application of heat and various forms of electricity; but, finally, it came to a question of stretching and manipulation, and sometimes most unpromising cases, by persistent work and efforts, were enabled to make a good recovery.

Another class of cases that we had—that we always have—were those in which the nerves had been divided and reunited by suture, with consequent slow reestablishement of motion. The treatment was very much the same as for anterior poliomyelitis. The lines of communication have been destroyed, completely or partially, in both cases. It was for those patients that we found the necessity, not of manipulation only, but of reeducation.

It is unfortunate that our neglect of these two procedures has been such that we have given great vogue to the irregular schools to which Goldthwaite referred. The osteopath and the chiropractor have flourished in direct proportion to the neglect of the procedures which they practice. As they raise the standard of their education, which is being done among the osteopaths, their theories become less fantastic. As they increase their requirements, they become more modest in their claims, and as a result there fall out from their ranks those who are unwilling to study or to work, and they form newer cults whose fancy is untrammeled by a knowledge of the facts. The remedy for this condition, the way in which we have got to combat it—and we have to fight it—is to teach the fundamental principles of manipulation, massage, and reeducation to the medical student. And I am glad to say that school after school is recognizing this fact, and is introducing courses on the subject. It is now almost universal to prescribe massage for suitable cases, but unfortunately the doctor often dismisses the subject with his prescription. He does not very often realize the necessity of differentiating between kneading and the light stroking movement of effleurage for the relief of pain, the kind of movement that you will use over an irritated or inflamed part, in the neighborhood of a sprain or a fracture, the preliminary movement which is necessary in most cases of that kind. He does not realize the rapid exhaustion that comes to nerves from vibration over a sensitive nerve. He does not recognize the difference between such a movement and the deep kneading which goes under the name of petrissage, in which circulation is pushed along almost mechanically, and in which the deep tissues under the hand are moved and manipulated. He usually prescribes it in such general terms that the only thing necessary for the masseur or for the masseuse is to have physical strength and good will.

If we are to have a complete system of medical treatment this subject must be recognized and studied, and the only way that it can be recognized is by making it part of the education of the medical school.

During the war I had charge of one of these command depots that Goldthwaite spoke of, in which we had some 5,000 men who had been wounded, and we gave sometimes 400 or 500 treatments a day, stretching scars, and reeducating muscles after nerve sutures, and continually we had visiting physicians who, for the first time, began to realize that massage was not just rubbing, and that reeducation was a part of medical treatment.

Let me say just one word about reeducation. In a case of anterior poliomyelitis and a case of nerve suture, you very frequently find that there is no apparent movement under the ordinary tests. If, for example, you take an injury to the circumflex nerve, you ask the patient to raise his arm, he is unable to do so, and you may conclude that there is no return of action to the deltoid.

It is necessary to try more delicate tests than such a rough and ready one, and also to encourage the slightest beginning of a return of movement, and to nurse it along as a most precious symptom. For testing purposes very many devices have been used. A very good one is to place the limb in water and so to overcome the force of gravity, so that the slightest movement is visible. An ingenious device places the arm of the patient upon a very smooth level surface, so that it can be moved with the slightest possible friction. Another way that was designed during the war was to place the leg on a trolley, with ball-bearing wheels, so that the movement of abduction or adduction were possible with the slightest amount of physical effort. It is hard to realize the amount of encouragement that comes to a patient by the discovery of some slight improvement. It inspires him to know that a joint which last week was capable of movement throughout thirty degrees can now move thirty-five degrees. We are apt to overlook this psychological aspect. In addition to treating a patient, we are also treating a person, and we must use every way within our reach to increase the amount of interest taken by the patient. For that reason we use various devices with a sort of sporting interest. And I think it might interest you to know the principle upon which some of them are devised. A weight is raised by the muscular action of the muscles to be exercised. It runs up like a clock weight, and each turn gives a click. The patient can find out if the amount of movement is improving by the number of clicks. The getting of the weight up to a certain point and then having it run down and hit the floor had a stimulating and dramatic effect upon the patient. It is very much the same principle that one sees at the fair, where you are handed a mallet, hit a post sending an indicator up a scale to a bell, and if you ring the bell you get your money back; an irresistible temptation to a good many.

From such simple appliances in which the muscular group is isolated, we go on to exercises that are in the form of games or occupation, and I remember very well a number of men with scars on the forearm with tendon involvement, so that it was impossible to completely close the hand. We gave them light boxing gloves and a punching bag, and let them work with them. It was extraordinary how quickly some of these patients regained the amount of movement desired. Their attention was diverted from pain to the hitting of the bag.

All the exercises should be put in the form of games or occupations wherever possible. And it is only a step, of course, from the playing of games to the practicing of occupations. Various devices have been worked out for that purpose. One of the simplest and one of the most efficient was for cases where the grasp of the hand was weakened, and in which it was impossible for a patient to close his hand on a tool handle. The device was

to take a lump of wax, put it round the hammer handle, and have the patient close his hand on it and then have it hardened. In this way he could use the tool, although he was not able to completely adapt his hand to the shape of the original handle.

These are some of the ways in which reeducation can be practiced. We do not realize in medicine how much of our work must be reeducation. The improvement of certain phases of speech defects like stammering and stuttering are purely questions of the reeducation of the apparatus for breathing, phonation and articulation, and the treatment for ataxia is a question of reeducation of powers that are lost.

If we will only pay the attention we should to the study of the physiological effects of Physiotherapy, to the technique of manipulation, to the procedures of massage, and to this question of reeducation, we will go far to establish, in its proper relationship, the kinship of Physiotherapy to the general practice of medicine, and we will be able to show up in their true light those pseudo cults which have flourished so luxuriantly because of our neglect.

LIST OF PHYSIOTHERAPY SCHOOLS APPROVED BY THE AMERICAN PHYSIOTHERAPY ASSOCIATION, JANUARY, 1928

The New Haven School of Physiotherapy, 303 Whitney Ave., New Haven, Conn., Harry Eaton Stewart, M. D.

Philadelphia Orthopedic Hospital, 17th and Summer Sts., Philadelphia, Pa., Miss Jane M. Farrell.

Children's Hospital, Sunset and Vermont Aves., Los Angeles, Calif., Miss L. H. Graham.

Northwestern Medical School, 303 East Chicago Ave., Chicago, Ill., John S. Coulter, M. D.

Harvard Medical School, Longwood Ave., Boston, Mass. (Post Graduate Courses), Course No. 441, Miss Janet B. Merrill; Course No. 442, Miss Mary McMillan.

Battle Creek Sanitarium, Battle Creek, Mich. (Post Graduate Course), Mrs. Mary Staines Foy, R. N.

Walter Reed General Hospital, Washington, D. C., Miss Emma Vogel.

Tacoma General Hospital, Tacoma, Washington, Ruth C. Babb.

Pronated Feet in Relation to Chronic Strain of the Lower Extremities and Back

By Varnum C. Southworth, M.D., Philadelphia, Pa.

The leading orthopedic surgeons have, for a long time, contended that improper weight bearing is one source in keeping alive chronic sprains and strains of the lower extremities and lower back. Although I have quite carefully gone into the literature, I have found nothing which definitely relates to the faulty mechanics of the lower extremities and spine as a result of flat feet. It is, therefore, the object of this paper to briefly describe and outline what part flat feet have in keeping alive these previously mentioned conditions.

First, let us delve into the arches of the foot. Anatomically speaking, there are three arches. The first and most important, the long arch, has one pier at the os calcis, the other at the heads of the first three metatarsals, with its summit at the superior articular surface of the talus. Its characteristic is elasticity, and its weakest point is the calcaneo navicular articulation. This articulation is strengthened by the plantar fascia, and the blending of the deltoid ligaments with the ankle joint. The arch is further supported by the attachment of the tibialus posticus, the tendons of the tibialus anticus and posticus, the peroneous longus, and the small muscles of the sole of the foot. However, it is believed by some that the last-mentioned tissues play only a small part in supporting the arch.

The lateral arch has one pier in the outer side of the os calcis, and the other at the heads of the fourth and fifth metatarsals, with its summit at the calcaneol astragular articulation. The chief point is the calcaneo cuboid, and it is solid and has slight elevation. Its reenforcements are the long plantar and calcaneo cuboid ligaments, extensors of the toes, and short muscles of the little toes.

The transverse arch is made up of half domes, except at the posterior border of the metatarsus and anterior border of the tarsus, and is strengthened by the inter-osseous, plantar and dorsal ligaments, and by the adductor hallucius and peroneous longus.

There is still another arch, or better curve, of the foot, which, although not mentioned by anatomists, I find of great help to me in first determining pronation of the foot. The curve begins at the distal end of the first metatarsus, curves laterally and superiorly, with its summit at the astragulo-scaphoid articulation, and its base on the medial aspect of the os calcis, posterior to the sustentaculum tali. In all feet with pronation, this curve is the first to become obliterated.

Proper Weight Bearing of the Foot

The correct weight-bearing line of the foot extends down the crest of the tibia, through the center of the body and the head of the astragulas, through the lateral aspect of the scaphoid, through the superior aspect of the articulations of the first and second cuneiforms, down to the second metatarsus and on to the second toe, thus affording the long arch the greatest amount of elasticity. By observing the skeleton, it will be found that the body weight is transmitted through the astragulas and distributed on to the foot through bony contact, and, if this weight distribution is properly maintained, no ligaments will have strain placed upon them. In the pronated foot, the line follows down medially over the first cuneiform and first metatarsal, having a tendency at the same time to push the great toe lateralward; producing an irritation of the medial aspect of the distal end of the first metatarsal, with a resulting exostosis or bunion. Pronation also rotates the tibia externally, placing strain upon the lateral ligament of the knee.

The sprained ankle is quite irritated by the pronating foot, because the strain is placed upon the calcaneonavicular ligament, which, you will remember, blends with the deltoid ligament of the ankle. Consequently, there is a direct relation between the previously sprained deltoid ligaments and pronation.

Pronation stretches the tendons of the tibialus anticus, and posticus, and relaxes the tendons of the peronei with subsequent shortening. Likewise does it eventually produce contracture of the tendo achilles, causing pain in the antero-lateral and posterior portions of the leg.

In carefully examining case records, it will often be found that an old chronically irritated foot and ankle is immediately relieved by proper pads and shoes, and teaching the patient how to stand and walk correctly. Therefore, I take this as proof enough that a painful ankle resulting from an acute sprain can materially be benefited by correcting the weight-bearing position of the foot. It is with this point in mind that adhesive strappings, plaster casts, or other support be supplied.

In considering injury to the knee, perhaps our most frequent one is the chronic strain, either following trauma, or as a result of long, continuous improper weight bearing, plus an increase in body weight. All too frequently, this condition is spoken of as rheumatism and treated with internal medication and external linaments, without more than temporary relief.

To more completely understand the way in which improper weight bearing can similate rheumatism, let us briefly go into the anatomy of the knee joint. First, the motion of the knee is not truly a hinge joint, because the tibia slides forward and backward upon the femur; also, on flexion, there is a slight amount of rotation which exists almost to full extension of the knee joint. Second. (A) The ligaments which merely assist in stabilizing the knee joint are the external lateral ligaments with their superior attachment at the superior condyle of the femur and their inferior attachment at the lateral condyle of the tibia. (B) The internal lateral ligament with its superior attachment at the internal condyle of the femur, and its inferior attachment at the medial condyle of the tibia. These are all materially strengthened by the capsule of the knee joint, by the patellar ligament, and by the attachments of the hamstrings, tensor fascia lata, and so forth. The semi-lunar cartilages act somewhat as medial and lateral wedges in further stabilization. The position of the knee joint being between the longest bones of the body is necessarily subjected to violent leverage which can be applied suddenly, as in flexion of the knee with the foot held firmly, or in twisting the foot with the hip fastened. In this type injury, the lateral ligaments of the knee are very frequently in-

volved at any or all of their four attachments, particularly if the motion of rotation has been instituted in the strain.

EXAMINATION OF THE KNEE

In determining the location of the injury to the knee, place the thumb and forefinger on each side of the patella ligament and press gently into the joint cleft. If the injury is within the knee joint, puffiness can be determined. This puffiness is due to the swelling and hypertrophy of the allar ligaments. Some examiners even go so far as to say that they can feel a fractured semilunar cartilage. Next, place the fingers over the condyles of the femur. Gentle pressure will elicit tenderness if the superior attachments of the lateral ligaments are being injured. Likewise pressure over the condyles of the tibia will produce painful sensations if these be involved. Weight bearing upon the pronated foot necessarily produces a slight obtuse angle at the knee, the tibia facing superiorly and medially, the femur going inferiorly and medially. This condition is commonly known as genu varum, or knock-knees. In this way the knee joint attempts to correct the unbalanced weight bearing of the foot. This unstable weight-bearing alignment necessarily throws undue stress upon the stabilizing of the knee joint, constantly producing a low grade trauma with each step. Naturally enough, the allar ligaments and the semilunar cartilages are also affected, and, with the overweight of the body, these factors are sufficient to produce traumatic arthritis. Therefore, it is easy to understand how internal medications and local applications of medicine are futile in aiding these conditions without first correcting the cause.

The hip joint is the most stable joint in the entire body, and this is probably due to its heavy capsule, its strong ligaments, its very heavy musculature, and lastly the architecture of the joint itself, with the large ball and deep acetabulum. It is not often that the joint is chronically strained, but occasionally a patient does complain of tiring of the hip on long standing or walking. Here, again, the hip joint attempts to compensate for faulty weight bearing, and the strain is thrown on the muscles and the ligaments of the joint, and the weight of the body is not taken properly upon the head of the femur.

It is commonly understood that the body weight is transmitted down the spinal column through the lumbosacral articulation, through the sacrum, to the sacroiliac joints, to the ilium and down the extremities. It has also been proven that the sacrum acts as a wedge between the ilia and the sacroiliac joint, and is more or less a buffer. It is so constructed that when weight is applied in the correct position, the transmission of force is practically from bone to bone through the medium of cartilage. If, however, one or both lower extremities are out of alignment, then the transmission of weight is not through the bony approximations, but is taken upon the none too strong sacroiliac ligaments. When we consider that constant tension on ligaments produces pain, it is easy to understand how one can have sacroiliac pain from pronated flat feet.

A review of the literature shows us that the articulating processes of the sacrum and fifth lumbar vertebra, despite the very thick intervertebral disc, form the only bony stability of the joint. The lumbosacral ligaments made from nonelastic fibrous tissue are the two chief ligaments of this joint. They are long and slender, and when the muscles about the joint are relaxed, which occurs prior to muscular exertion in the semiflexed and twisting attitude, they are subjected to undue strain. Consequently it is not infrequent for active men and women to subject themselves to back injury. Here again weight bearing is transmitted from bone to bone with the intervertebral disc as a buffer.

Now if the line of weight bearing has been altered by the pronated foot, the line of force of torso weight is no longer transmitted directly through the fifth lumbar vertebra to the sacrum, without the constant strain of ligaments. This strain may not be very great to a back which is well supported by muscles, but let these muscles become injured, and the improper placing of torso weight aids and abets the strain or sprain, and the patient goes on suffering until the line of weight bearing is adjusted.

The one weak point is that it does not always hold true that pronated feet will produce all of the previously described symptoms, but in reviewing the causes of chronic strain of the back, hips, knee and ankle, the majority of the patients are relieved of many of these symptoms by properly aligning the foot with the rest of the extremity.

The Physiotherapy of the Cortically Rigid

By S. F. Stewart, M.D., Los Angeles, Calif.

Read before the eighth annual convention of the American Physiotherapy Association, Portland, Ore., July, 1929

Tonight we are to discuss the treatment of one of the most unforunate and neglected classes of patients. Their condition is no fault of their own or of their parents. It arises from several causes more or less well understood, occurring both before and after birth. The victim is impaired mentally and physically in varying degrees. Some classify them as idiots and feeble-minded. Long contact has changed my views in this regard. Frequently, it is not the intake but the output that is disturbed.

Physically, some of these little ones cannot sit alone, some cannot stand or walk, and some have speech difficulties of varying degrees. These disabilities arise not because of paralysis but because they are so stiff they cannot move the parts easily enough to keep their balance, or to move with facility and rhythm.

Careful observations will show that the rigidity is neither constant in degree or location, but is changed by many factors among which are: (1) Changes of posture cause a change in distribution as well as degree. (2) Weight bearing intensifies the difficulty. (3) Attempts at motion still further intensify the rigidity. (4) Physical or mental excitement may change a fairly supple individual into one hopelessly rigid.

The lesion that produces these effects is located in the cortex of the brain, and for that very reason the physiological effect of the lesion may be most widespread. The lesion in the brain is either a miscarriage of development or a destruction of greater or less portions of the cortex. It is obvious that man can neither build afresh or remodel changes of such a character. Hence the surgical attack on this problem must be directed to a remedying of the untoward peripheral manifestations, and a cursory review of the angles of attack is not out of place.

Originally, man thought that the cutting of tight cords was all that was required, to relieve these patients. Their condition was improved for they could now stand flat on their feet, and in some cases learned to walk without crossing their legs, but this surgery did not relieve stiffness.

Subsequently, it was learned that division of the sensory roots to an extremity relieved the stiffness, but the mortality was so high and the neurological mutilation so severe that the procedure was abandoned.

Later, one set of muscles were conceived of as being stronger than their opponents, and it was reasoned that a partial paralysis of the stronger would create a muscle balance that would permit improvement in motion. This operation of Stoeffel gave the best results up to 1923.

In that year an Australian surgeon named Royle proposed and executed a division of the sympathetic nerves to the extremities with the idea of causing a change in the tone of the muscles. Changes in rigidity occurred as we shall show you, but the explanation for the phenomena is still desired.

The thing which this and the succeeding paper will attempt to do is to put before you a discussion of the after-training of these individuals that will be of some practicable use to you in your daily work. We would present these truths as axioms, and then illustrate them.

(1) Physical stimuli of every sort should be minimal. Effleurage to the average person is relaxing, but to a spastic individual it is stimulating, intensifying their difficulties, and hence instead of being beneficial is distinctly harmful. Next of kin to massage is stretching, which may be either beneficial or harmful, depending on how it is done. If one takes the foot of one cortically rigid and suddenly tries to force it into dorsiflexion, one encounters a greatly increased resistance. On the other hand, if one firmly, smoothly and gently draws the foot upward, one can surely overcome the contracture, but if structural changes are present the yielding is slight. In the treatment of structural contractures we do not follow the old method of tendon lengthening, but prefer to stretch the cords in a properly designed cast. This procedure of gentle, passive stretching may be called the Weir Mitchell treatment after the one who first pointed it out. The employment of electricity in any form, being the most distinctly potent and direct form of stimulation that can be used on these children, shows a total lack of understanding of the condition with which the surgeon is dealing and usually frightens the child so that to our mind the procedure is little short of criminal.

(2) Mental excitation, likewise, should be minimal. It is an old aphorism that these children should be raised in the country, the sense of this being that in the country the sounds are low-pitched, frequently repeated and are not unexpected, whereas in the city the sounds are high-pitched, irregular and most unexpected. This aphorism is truer today than in the days when it was first uttered. Not only should the psysiotherapist be a good physiotherapist, but she should also be a good psychotherapist, and usually has two patients instead of one, the child and its mother. Too frequently the mother of such a child is an ambitious, impatient person who fumes and fusses at the slowness and imperfections of the little one. This is a bad influence. Likewise the physiotherapist that undertakes the work with these children should be an even-tempered individual who carries to her work the desires of an artist for perfection, and an inspiring assurance. Above all things she should not be whining and despairing of accomplishing anything with the patient, especially to his face. These children have enough to overcome without breaking down the resistance of an unwilling worker. It is likewise obvious that for her best work she should work with the child alone, where there will be no distractions or interruptions. We feel that encouragement is a great factor in dealing with these children, not a false one, but one that is honest and is backed by obvious attainment and anticipation of still further advances. In the more advanced cases one may desire to teach rhythm in ac-

tions, in which case the low, strumming music of the primitive people is better than that of barbarized civilians.

(3) The third axiom is scriptural, "here a little and there a little." These children may be hindered in development by any one or more of the following factors: low mentality, false habits, the development of proper habits. We must not forget that we did not learn to stand or walk in a day, but that the perfect act was accomplished through much failure, and these children have the same difficulties as we had, only theirs are multiplied by their rigidity and incoordination. It is essential therefore that a perfect act be broken down into its separate parts, and that the idea of the act should be built into the child's mind, block by block, until he can accomplish the perfect act perfectly. In doing all these things, the goal should be held before the child so that he can do the things that other children do, in the way that other children do them.

(4) Finally, I would commend to you patience, for it may take years to accomplish your purpose. If you are impatient, seek other more seasonal fields.

Officers and Executive Committee of the American Physiotherapy Association, 1928-9

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EDITORIALS

"Living is made up of human attachments and enthusiasms and sympathies and sharing your interests with those of like tastes. That is living, no matter what else life may bring or fail to supply."

All of us should give attention to local and national affairs, and strive to form intelligent opinions on the various subjects that come before the association.

We are in an interesting period of development, still on the frontier, with opportunities ahead for ever closer working relationships with doctors and medical associations.

So let us preserve our fine standards of courtesy already won and try for even greater records.

L. A. W.

A most interesting and gratifying condition has arisen in Newark, N. J. In one of the finest and newest hospitals in the state is a training school of Physiotherapy, which is entering its fourth year, in January, 1930.

The physician in charge and his chief assistant, one of our members, were discussing their course in conference; the whole gist of their conversation being, "If this course does not reach the standards of the American Physiotherapy Association, what must be done to bring it up, for we want the graduates of this school to be eligible for membership." They were advised to communicate with the national committee on publicity and education.

The superintendent of another hospital in the same city, having a former graduate of this school as head of his Physiotherapy Department, insists that if this young lady is not at present eligible for membership in the American Physiotherapy Association she "must be, to be" and wants her to return for further study, as he wants no workers in his hospital who do not fulfill the requirements of the association.

This is a big step towards the goal for which we have all been striving.

Standardization of courses of instruction in the arts, professions, and vocations has become one of the essentials of modern education.

In no group is this standardization of instruction and training more essential than among those who minister to the sick and injured, who should be protected in every way and by every means from the poorly trained, inefficient practitioner.

Standards for schools of medicine and registration of practitioners have been established. No doctor can practice in a state without first taking the state medical examination. Schools of medicine have been graded and greatly reduced in number with a resultant higher standard of education. Through frequent inspections the high standards of these schools are maintained. Today there is little reason for a patient to employ any but a well qualified physician.

Nursing laws have been enacted establishing standards of preliminary education and professional training for nurses and requiring an examination in nursing under a state board of examiners before a license to practice in a state is issued. Unfortunately these laws are not uniform in all states, but efforts are now being directed toward this end. In the meantime among those states having substantially the same provisions in the law nurses may register by reciprocity.

The boards of nurse examiners, composed of nurses, and in some cases of physicians, are charged with the responsibility of holding the examination, rating the papers and issuing the certificates of registration, and inspecting nursing schools in the state.

A study of these laws is advisable before undertaking the passing of similar laws for physiotherapists. The state law for the registration of nurses can be obtained in each instance from the secretary of the nurses' examining board.

Physiotherapists first came into prominence during the war when the physical re-education of wounded men was a matter of paramount importance in complete rehabilitation. Massage was an established profession. Electrotherapy had not been developed to its present high state of efficiency, nor was its use as universal as it is at the present time. In hydrotherapy, diatheramy, and all other means now used in physical re-education, tremendous strides have been made in the past twelve to fourteen years. For most injuries and many medical cases some form of Physiotherapy is prescribed and found helpful, and it is a backward hospital today which has no department of Physiotherapy.

With the entry of the United States into the world war the need of many trained physiotherapists was foreseen and steps taken to develop intensive courses in the training of reconstruction aides, as it was decided to call them. The value of the service was so well demonstrated that it has become a definite part of medical treatment. The number of trained Physiotherapy practitioners is small compared with physicians and nurses. So much time had to be given to establishing training courses and getting the work done that it is only now that the national Physiotherapy organization is preparing to secure registration in the states similar to registration of doctors and nurses. This movement is one deserving of support from all who are interested in the advancement of adequate care of the sick.

In initiating his effort the American Physiotherapy

Association has an advantage in that it can from the beginning advocate and try to establish uniform laws governing the practice of Physiotherapy, so that many of the difficulties from differences in state laws would be eliminated.

Establishment of standards both for training and practice is necessary for the protection of the public from partly trained and inefficient practitioners, and for the protection of the adequately trained worker from competition with the untrained or poorly trained.

Following is a list of section chairmen of the legislative committee: Chicago Chapter, Miss Irma Walker, 7027 S. Park Ave., Chicago; Minnesota Chapter, Miss Sarah Kollman, Gillette State Hospital, St. Paul; New York Chaper, Miss Emily Griffin, 614 Park Ave., Plainfield, N. J.; Southern Calif., Miss Susan Roen, 2417 S. Hope St., Los Angeles; Wisconsin, Miss Laura Borwell, 109 W. Wilson Ave., Madison; Massachusetts, Miss Mary McMillan, Westbourne Terrace, Brookline, Mass.; Pennsylvania, Miss Mary Rump, 1913 Mt. Vernon St., Philadelphia; Washington, D. C., Miss Mary Lee Castleman, 1801 I St.

FRIEDA GASSIN,
Late Chairman L. C.

This is recommended to you for your thoughtful consideration.—F. G.

[PUBLIC—No. 966—70TH CONGRESS]
[H. R. 15387]

An act to amend the act of Feb. 9, 1907, entitled "An act to define the term 'registered nurse' and to provide for the registration of nurses in the District of Columbia."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that from and after June 30, 1929, the Act of Feb. 9, 1907, entitled "An act to define the term 'registered nurse' and to provide for the registration of nurses in the District of Columbia," be amended to read as follows:

"That from and after the 30th day of June, 1929, no person shall in the District of Columbia in any manner whatsoever represent herself to be a registered, certified graduate, or trained nurse, or allow herself to be so represented, unless she has been and is registered or is registered by the nurses' examining board in accordance with the provisions of this act.

"Sec. 2. The nurses' examining board shall be composed of five members appointed by the commissioners of the District of Columbia. Those persons who are members of the nurses' examining board on June 30, 1929, shall continue to be members of the said board for the remainder of the terms for which they were appointed. The term of each member of said board shall be five years. All appointments shall be made so that the term of one member expires on the 30th day of June of each year. Each vacancy or unexpired term shall be filled by appointments from a list of five nominees submitted to the commissioners of the District of Columbia by the Graduate Nurses' Association of the District of Columbia. Each nominee shall have had not less than five years' experience in the profession of nursing, be a registered nurse registered in the District of Columbia, and a member of the Graduate Nurses' Association of the District of Columbia. The Graduate Nurses' Association of the District of Columbia shall make such nominations to the said commissioners. No members of said board shall enter upon the discharge of her duties until she has taken oath faithfully and impartially to perform the same; and the said commissioners may remove any member of said board for neglect of duty or for any just cause.

"Sec. 3. The nurses' examining board shall meet in the District of Columbia between June 30, 1929, and July 15, 1929, and organize the board in accordance with the provisions of this act, and annually thereafter shall meet in the month of April for the annual organization of the board. At each such organization meeting the board shall elect from its members a president and a vice president, and it shall also appoint an executive secretary of the board, who shall not be a member of the board, but who shall possess the requirements necessary for membership in the board. The secretary-treasurer of the said board who is acting in that capacity on July 1, 1929, for the unexpired term commencing in April, 1929, shall cease to hold office as secretary-treasurer of the board on and after July 1, 1929. The executive secretary shall ex officio act as treasurer of the board and as such shall furnish a bond in the penal sum which shall be fixed by the commissioners of the District of Columbia. The said board shall adopt such by-laws as it shall deem necessary for carrying into effect the provisions of this act and many amend such by-laws from time to time at the discretion of said board. The executive secretary shall be required to keep a record of all meetings of the board and also a register of all nurses duly registered or reregistered under this act, and to furnish a certificate of registration or of reregistration to all such nurses; also to maintain a registry of nurses' training schools in the District of Columbia approved by said board. The board shall hold examinations not less frequently than once a year, and notice of each examination shall be given in one daily newspaper published in Washington and in one nursing journal at least thirty days prior to the examination. The executive secretary shall inspect all recognized schools of nursing in the District of Columbia, and report to said board as to the sufficiency and quality of training afforded by such schools. The executive secretary may be removed by a majority vote of the said board for neglected duty or any just cause.

"Sec. 4. That every nurse desiring to register in the District of Columbia shall make application to the nurses' examining board for examination and registration, and at the time of making such application shall pay to the treasurer of said board $10. Said applicant must furnish satisfactory evidence that she is over twenty-one years of age, or that she will attain the age of twenty-one years within six months after the date fixed for the necessary examination to be held by said board after the date of such application. Except as otherwise provided in this act, an applicant shall not be registered unless she has passed an examination by the nurses' examining board. No nurse shall be registered in the District of Columbia who has not attained the age of twenty-one years. Said applicant must also furnish satisfactory evidence of good moral character, and further that she holds a diploma from a training school for nurses which has been registered by the nurses' examining board of the District of Columbia: Provided, however, that no training school shall be registered which does not maintain proper educational standards and give not less than two years' training in a general hospital, or in a special hospital with adequate affiliations, all of which shall be determined by the nurses' examining board.

"Sec. 5. That any nurse who is at least twenty-one years of age and of good moral character and who presents satisfactory evidence that she has, prior to July 1, 1924, graduated from a school of nursing connected with a hospital, and that she has been engaged in nursing in

the District of Columbia prior to July 1, 1929, shall be entitled to registration without examination upon payment of the registration fee of $10: Provided, however, that application for such registration must be made on or before June 30, 1932.

"Sec. 6. That the nurses' examining board shall register in like manner without examination any graduate or trained nurse registered as a nurse by examination in another state or territory who holds a diploma from a nurses' training school outside of the District of Columbia which, in the opinion of said board, maintains a standard substantially equivalent to that provided for by this act.

"Sec. 7. Each nurse who has been registered in the District of Columbia shall be registered each year on the 1st day of July upon application to the executive secretary of said board and the payment of a fee of $1: Provided, that such fee of $1 shall not be payable in case the applicant has been originally registered within the twelve months next preceding the day for reregistration. Application for reregistration may be made within sixty days preceding the day of reregistration. Registration of any nurse who does not thus apply for reregistration for any year shall be automatically canceled as of the beginning of such year. The by-laws adopted by the nurses' examining board shall define the conditions upon which the registration of a nurse may be restored. Schools of nursing in the District of Columbia may apply to said board for registration and, with the exception of schools of nursing maintained at government expense, shall pay a fee of $25 at the time application is made. Each such school registered shall apply each year for reregistration, and, with the exception of schools of nursing maintained at government expense, at the same time pay a fee of $1: Provided further, that on the petition of any applicant to whom registration or reregistration has been denied by the nurses' examining board, the action of the board may be reviewed by the Supreme Court of the District of Columbia on a writ of certiorari, subject to appeal to the Court of Appeals of the District of Columbia, in the same manner as appeals are taken in similar cases.

"Sec. 8. No person shall file or attempt to file with the nurses' examining board of the District of Columbia any statement, diploma, certificate, credential, or other evidence when she knows, or when she might by reasonable diligence ascertain, that it is false and misleading. The Supreme Court of the District of Columbia, sitting as a court of equity, may suspend or revoke any certificate issued and any registration effected under this act upon evidence showing to the satisfaction of the court that the registrant has been guilty of misconduct or is professionally incapacitated. Proceedings looking toward the suspension or revocation of a certificate or registration shall be begun by petition filed in the Supreme Court of the District of Columbia in the name of the nurses' examining board, or of the commissioners of the District of Columbia, or of the major and superintendent of police of said district, and shall be verified by oath. Proceedings shall be conducted by the United States attorney for the District of Columbia according to the ordinary rules of equity practice and such supplementary rules as said court may deem expedient to carry into effect the purpose and intent of this act. An appeal may be taken from the decision of the Supreme Court of the District of Columbia to the Court of Appeals of said district. Any such appeal on behalf of the commissioners of the District of Columbia or of the major and superintendent of police of said district may be filed without bond. The Supreme Court of the District of Columbia may determine whether a certificate or registration shall be suspended or be revoked, and if such certificate or registration is to be suspended said court may determine the duration of such suspension and the conditions under which said suspension shall terminate.

"Sec. 9. That all expenses incident to the execution of the provisions of this act shall be paid from fees collected from schools of nursing and from registration or reregistration of nurses. The executive secretary of said board may receive a salary to be fixed by said board at its annual organization meeting not to exceed the rate of $200 per month. Each member of the board shall receive a per diem allowance at the rate of $10 per day for each full day such member is actually engaged in the performance of duties as a member of the board. The payment of such per diem allowance shall be made from any unexpended balance in the treasury of said board remaining on June 30 of the year during which the services have been rendered, and if the unexpended balance is insufficient to meet the total amount of such per diem allowance, the rate of compensation shall be reduced to a rate which will permit payment from such unexpended balance. That such expenses shall in no event exceed the total of receipts. All registration or reregistration fees shall be paid to the treasurer of the board, and shall be paid out under the orders of the board. That it shall be the duty of the auditor of the District of Columbia to audit the accounts of the nurses' examining board at the end of each fiscal year and to make report thereof in writing to the commissioners of the District of Columbia. The said auditor shall have free access to all books, papers, and records of the board. The nurses' examining board shall make annual reports to the commissioners of the District of Columbia containing a statement of moneys received and disbursed, and a summary of its official acts during the preceding year.

"Sec. 10. That any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not exceeding $200 or by imprisonment in the workhouse for a period not exceeding sixty days.

"Sec. 11. That nothing in this act shall be construed to prevent any person from nursing any other person in the District of Columbia, either gratuitously or for hire: Provided, that such person so nursing shall not represent herself as being a registered, certified, graduate or trained nurse.

"Sec. 12. That the word 'she' and the derivatives thereof, wherever they occur in this act, shall be construed so as to include the word 'he' and derivatives."

Approved, Mar. 2, 1929.

Bureau of Appointments

October has been a busy month for the Bureau of Appointments. One hospital in California, four in Ohio, two in Pennsylvania, one in Virginia, one in Michigan, and one in Maine have written about vacancies. Ten in one month; isn't that great? Forty-four members were recommended—results unknown.

During the latter part of October letters were sent to all members—27 in number—in the active file, asking for any changes in addresses or plans, as I do like to have the latest news about everybody, and may I remind all that suggestions will be greatfully appreciated?

C. GRACE COURTER,
Director, Bureau of Appointments.

Nov. 1, 1929, Washington, D. C.

High Colonic Irrigations

C. B. Lamp, M. D., Monongahela, Pa.

Reprinted by permission from the American Journal of Physical Therapy, July, 1929

Much has been written upon intestinal toxemia, yet I feel that it has not received the wide recognition that it deserves. Large numbers of individuals remain in disturbed mental and physical health solely because of a failure to recognize the colonic tract as a focus of infection.

Many eminent authorities agree that the presence and absorption of colonic bacteria and toxins are responsible for the majority of human ailments. Usually intestinal toxemia develops insidiously, and there is a regrettable delay in its early apprehension. The early and sometimes the later more pronounced toxic symptoms often tax to the utmost the ingenuity of the consulting physicians who would unravel its pathogenesis. It is very probable that there is no other part of our body that brings about more deleterious effects upon our system than that of the colon; and equally probable that no other part of our system has been so uniformly neglected. Large proportions of these individuals drift into a state of more or less complete invalidism, for unfortunately the profession at large so seldom recognizes the true nature of the case.

Systemic toxemia, from intestinal auto-intoxication or absorption of poisons from the bowel, and the resultant lowered resistance, has been proved responsible for many focal infections and disturbances of metabolism. Efforts to treat this endocrine unbalance are usually futile, unless the conditions that deplete the endocrine glands are removed. Mouth, teeth, sinuses and tonsils may all be factors, but the basic cause in eighty per cent of the cases will be found in the large bowel. Later, as toxemia increases and resistance is lowered, focal infections will flare up in the nose, throat and elsewhere. So malfunction is frequently primary and disease secondary, and therefore many diseases can be eliminated by the restoration of normal functioning. We should assist our patients to pay more attention to those habits concerning the hygiene of their gastro-intestinal canal, as the continuous absorption of toxins from the bowel saturates the system with poisons. These poisons which wreak their damage on every organ and tissue of the body reach even the endocrine glands, and cause serious disturbances.

Many pages might be written of the causes and the various existing conditions that lead to faulty, irregular and insufficient elimination of waste material from the intestinal canal. A few of these causes may be here mentioned: atomic conditions of the intestinal and abdominal musculature with associated ptosis; infections of the intestinal wall with associated spastic conditions; mechanical interferences with fecal expulsion, acute and chronic affections of liver, stomach, and intestines; habitual and persistent use of cathartics; errors in diet; diseases of the secretory organs, and various diseases of the spinal cord. One may have one or more bowel movements a day, and still have stasis in certain parts or all parts of the large bowel; so regular bowel movements daily do not rule out intestinal toxemia.

When the contents of the large bowel are unduly delayed in their passage to the anus, and remain long retained in the bowel, chemical changes take place in the feces, and many of the waste products are split up into poisonous substances or toxins. Under normal conditions there would not be time for the formation of these toxins before they would be discharged from the body. In chronic constipation considerable quantities are formed while feces are still in the colon. They are absorbed and disseminated through the system, via the blood stream, slowly poisoning the individual by poisons formed in his own bowel. The same condition can result when the bowels are not constipated, but there is an inefficient movement, or there are local strictures, spasms, distortions, folds, bends, pockets, or sacculations, minute in size or large, that prevent thorough and prompt drainage. There is no doubt that many of the sacculations, etc., retain their contents for months, even years, and it is in these areas of stasis that the fermentative and putrefactive organisms grow and flourish. Colonies of bacteria can be found growing upon the mucous membrane lining just as are seen on the agar plate. This type of stasis and this bacterial growth absolutely cannot be removed by taking physics and purges, nor can the bacteria be destroyed by taking so-called intestinal antiseptics by mouth.

In considering symptoms, one must keep in mind, that in many instances the onset is so insidious that the patient is not conscious of its presence; in fact, he may consider himself in fairly good health with possibly the exception of experiencing some difficulty in sufficiently evacuating the bowels. With progress of the condition toxic symptoms will appear, gradually becoming more pronounced, and he will complain of dizziness, frequent dull headaches, lack of "pep," a tired feeling in the morning, and nervous irritability. The symptoms of intestinal toxemia will vary in nearly every case, all depending upon the stage of chronicity, the etiological or predisposing factors, and associated conditions. A patient may only complain that he is sick with no definite complaint, and again, if he is very toxic, may complain of all the symptoms of a general toxemia.

The symptoms of a general toxemia may be classified as follows:

Those referable to the nervous system. These patients have an apathetic, careworn expression; they are cranky, crabbed and cynical; they are easily worried, and molehills of trouble seem like mountains. Uncontrollable crying spells arise without apparent reason. Vasomotor paresis is evidenced by the red line that appears upon the skin after scratching. The patients have cold hands and feet—some complain bitterly of the cold. Other symptoms are dizziness, insomnia, headaches, mental hebetude, fainting, or all gone sensations, neurasthenia, psychosthenia; and mental symptoms that may border on those of insanity. Neuritis, neuralgia, or migraine may appear, sometimes irritability—excessive mobility of temperament, depressed one day, buoyant and high spirited the next, overkind, then brutal, and impossible to live with. Frequently mental and nervous symptoms had been the only complaint, no symptoms referable to the intestinal tract had ever been manifested.

Symptoms referable to abdomen are a sense of distension, usually epigastric, and immediately after eating, irregular attacks of nausea with or without vomiting, gaseous eructations, so-called "bilious spells," dragging sensation with pain in back or loins, loss of appetite, and dyspepsia. There may be vague abdominal discomfort, bowels may move daily but inefficiently; the patient may have marked constipation and occasional diarrhea. Constipation is the rule but not always so. Then, too, there are the symptoms of gastric and duodenal ulcers, and enteritis, colitis, and appendicitis.

Symptoms referable to the circulation are palpitation, a rapid, overactive heart or a slow, weak-muscled heart; cardiac irregularity from vagal irritation, missed beats, precordial anxiety, high blood pressure usually, but may have a sub-normal, secondary anemia, shortness of breath; easily exhausted, vertigo, cerebral anemia, sensation of faintness, splanchnic congestion, myocarditis, and endocarditis.

Symptoms referable to the muscles and the joints are painful and stiff muscles and joints, so-called rheumatism and arthritis.

The skin symptoms are urticaria, acne, boils, carbuncles, falling hair, baldness, herpes, pruritis, and dermatitis.

The eye symptoms are painful eyeballs, disturbances of vision, sense of distension, and cataracts (toxic deposits in the lens).

The genito-urinary symptoms are nephritis, pyelitis, and cystitis.

The catalogue of conditions arising from absorptions from the large intestine is so long that to name them would sound like "over-enthusiasm," if they were not vouched for by our greatest medical and surgical men of today. Sir Arbuthnot Lane of England, after listing and discussing innumerable diseases, made the sweeping assertion that "none of these conditions can arise except in the presence of intestinal intoxication." I will discuss briefly some of the most common conditions associated with intestinal auto-intoxication.

High Blood Pressure

First we have a chronic intoxication, the endocrine glands become depleted, the detoxicating organs become inefficient, and we have a chronic intoxication plus a deficient catabolism of the waste products of the body. These factors are the underlying causes of high blood pressure in the greatest percentage of cases. Intestinal toxins act through irritation to the intima of the arterioles and the vasomotor center, and produce toxic angio-spasm. The circulation of the toxins in the blood brings about an exaggerated vaso-constrictor irritability. This irritation plus the pulse violence eventually robs the arterial coats of their elasticity, and bring about other changes in the capillary walls. These pathological changes interfere with the exchange between the blood and the tissue cells. The normal permeability may never be regained if these changes have already become established; in that case the resultant high blood pressure will persist even after the toxins are removed. It, therefore, behooves us to remove the cause early, before the organic changes take place. The high blood pressure from intestinal poisons will respond to dietetic and eliminative measures if taken in time; that is, if the pulse pressure, plus the toxic irritation, have not robbed the arterial walls of their elasticity, and induced degenerative changes of the kidneys. Even after these organic changes have taken place, the colonic treatments will obtain relief from the subjective symptoms from the increased elimination and detoxication brought about. Colonic treatments are certainly the safest and most efficient method of lowering high blood pressure.

Acidosis

Our body tissues are normally slightly alkaline. When this degree of alkalinity is lessened, illness results and dangerous conditions arise long before the neutral point is reached. Death occurs if it goes beyond the neutral point, even to the slightest degree. The most common symptoms of acidosis are headache, nausea or vomiting, lassitude, loss of appetite, irritability, weakness, easily exhausted, muscular aches and pains, sour stomach, acid urine, mouth ulcers and ulcers of the stomach—later, symptoms of blood vessel changes, as high blood pressure, kidney and heart disease.

When an acid-base equilibrium is disturbed, the chief change that exists is a deficiency or loss of blood bicarbonates. The normal ratio between bicarbonates and free carbon dioxide is kept fairly constant by physio-chemical interchange between the blood and the respired air. This maintenance of equilibrium is more difficult when the body not only has to protect itself against the end products of metabolism, but also against the morbid influence of those acids that are the end products of bacterial activity in the colon. When it is unable to do this, acidosis occurs in greater or less degree.

The most common cause of acidosis can be found primarily in the intestinal tract where there is an excess production of acids that are the end products of protein putrefaction, carbohydrate fermentation, and food intoxications. The coexistent auto-intoxication depletes the endocrines and we have in addition to those acids formed in the colon, an excess amount of acids, which are developed as the end products of disturbed metabolism. A condition results wherein there is not only an overproduction of acids, but also a retarded elimination of them.

Diet is another factor to consider: for if there is an excess amount of acid ash foods partaken, and if they are improperly eliminated by the kidneys, there will gradually develop a greater degree of systematic acidity with a lessening of the alkalinity of the body. These cases either eat too much acid, or not enough alkaline ash foods to maintain a normal acid-base equilibrium.

The majority of acidosis cases can be prevented. If already present, the patient can be quickly relieved by colonic flushings which remove toxic wastes and putrefactive organisms. In addition to the colonic flushings, prescribe sparingly of the acid ash foods, and these foods should be well balanced by alkaline ash foods. Some of the more important acid ash foods are oysters, egg yolk, rabbit, chicken, veal, lean beef, oatmeal, fish (pike and haddock), rice, crackers, whole wheat bread, bread and peanuts. Some alkaline ash foods are lima beans, raisins, almonds, beets, beans, muskmelon, carrots, oranges, celery, potatoes, chestnuts, peas, lettuce, apples, bananas, cauliflower, currants, lemons, radishes, peaches and turnips.

Obesity

In general toxemia of intestinal origin, the endocrine glands are depleted and become inefficient. In obesity there is a deficiency of adrenoxidase, and pancreatic ferments in the blood due to the functional debility of the endocrines. Then fat accumulates because the carbohydrates are being inadequately broken down. That is why one often hears the remark, "Why, I hardly eat anything, yet I am still putting on flesh."

The indications are to increase catabolism, not by giving thyroid extract or starving the tissues, but by removing the cause of the metabolic unbalance. Colonic flushings are very essential to the treatment, as it is almost impossible to restore normal metabolism, unless the source of toxemia is removed. When normal metabolism is established, the tendency is for those overweight patients to lose weight until a normal weight is reached. Likewise the underweight patient will gain weight. Administration of weight-reducing medicines is not without danger. Then the results, if any are obtained, are but temporary, and frequently the gain in weight, when the drug is stopped, takes on a greater impetus than ever. Injudicious dieting is also harmful, it is a hardship, too, and here again the results, if any are obtained, are but temporary. Permanent results can only be obtained by removing the cause of the metabolic unbalance. The most logical and safest way to do this is to remove by high colonic treatments the source of toxemia that depletes the endocrine glands. Colonic stasis with its associated toxemia has been proved responsible for many other metabolic disturbances, including toxic goiter.

BRONCHIAL ASTHMA

The circulating intestinal toxins in the blood act upon the bronchial sensory end organs of the vagus. These cause afferent impulses to be transmitted to the vagal center. Normally they would cause periodic contractions of the bronchi, but being hypersensitive the center projects violent stimuli to the bronchial muscles and mucosa, which causes broncho stenosis, which in turn causes the asthma. The bronchial stenosis is due principally to the contraction of the bronchial muscles and congestive swelling of the bronchial mucous membrane. Bronchial asthma is usually considered a reflex neurosis, and is due primarily to oversensitiveness, and irritability of the vagal center. It is most commonly brought about by the absorption and circulation of the intestinal toxins. Many other exciting factors can be enumerated when the center is in an irritable state. The least irritation of any organ may cause a reaction in the bronchi, terminating in an attack. Other causative factors, such as anaphylaxis, idiosyncrasies, and disturbances of the general nervous system must be considered in some cases. Calcium deficiency causes over-excitement of the nervous system. The calcium content of the blood is determined and is kept at its required level by the internal secretions. These glands are usually depleted in cases of intestinal toxemia. The following picture is seen: intestinal toxemia, irritation of vagal center by circulating toxins in the blood, depletion of the endocrine glands, gradually decreasing calcium fixation in the tissues, lowering of the auto-defensive functions, and an unrestrictive progressing toxemia. An essential progress in the treatment of bronchial asthma was registered with the introduction of colonic treatments: removing putrefactive products from the colon; reestablishing the endocrine balance; and stimulating the detoxicating organs.

EPILEPSY

Epilepsy is a functional nervous disease, due to either organic lesions of the brain associated with pressure; or to functional derangements, due to a toxemia; or, as often is the case, due to both, that is, both conditions are present. In the latter cases there is an excess of toxic wastes, and excessive vago-constriction, and often a rise in arterial tension. These indications call for the removal of toxic wastes by means of a high colonic flushing to clear up the auto-intoxication, and prevent its recurrence. The reduction and proper selection of food is also of great value.

KIDNEYS

Hot colon irrigations are a quick, safe and powerful means to stimulate the kidneys into action. This method has a more powerful diuretic action than any drug, especially if a pint of hot water is retained in the cecum after the cleansing. Ten to twenty ounces of warm or hot solution can be retained in the colon; all of this will be absorbed into the blood stream. We find it a splendid way to treat nephritis; ridding the organism of toxic wastes and the source of toxemia, stimulating the detoxication organs, as well as obtaining marked diuretic effect by the hot irrigations. In the case of an acid urine, hot alkaline solutions, such as can be made with Citrocarbonate, Alka-Sal, and all similar preparations, are placed in and retained in the cecum. The alkaline procedure is continued and checked according to urinalysis with the object of keeping the urine slightly alkaline. Where the renal output is greatly decreased and there are signs of edema present, we are careful not to permit the absorption of too much fluid. In these cases we irrigate with hot concentrated solutions of magnesium sulphate, whose osmotic density prevents it from being absorbed from the bowel, yet removes the toxic wastes and depletes the body tissues. This method is an ideal method in any edematous condition.

In pyelitis cases three or four ounces of Hexylresorcinol diluted with warm water qs ounces eight, is planted in the cecum after cleansing and before taking the tube out. This drug is nontoxic and when absorbed clears up our pyelitis cases very quickly.

SPLANCHNOPTOSIS

The chief cause of ptosis is nondrainage. The colon becomes overloaded at various parts, pathological changes take place, diseased conditions appear, and the part becomes unable to contract and empty itself. Muscular tone is lowered. In general, the patients with acquired type complain especially of gastro-intestinal disturbances, and are apt to be classed as neurasthenics. Moderate ptosis in some cases may exhibit marked general phenomena; while others with the same or even greater degree of ptosis may not be conscious of ill health, except that they note a tendency to exhaustion, on slight exertion. The normal position of a dropped stomach will not necessarily become reestablished, but the stomach is a wonderful organ, and will functionate fairly normal, even if it is greatly ptosed, if it can regain and retain normal tonicity of its musculature and glandular tissue. It is not unusual for an individual, the subject of this condition, to pass through numerous hands, medical and even surgical, without the true nature of the condition being discovered. The symptoms are faulty nutritional states, dyspepsia, constipation, vague pains throughout the body, backache, neurasthenia symptoms, fainting sensations, or sudden weak spells, more or less exhaustion after slight effort, anorexia or a capricious appetite, a sense of distension usually in epigastrium occurring after meals, nausea with or without vomiting, gaseous eructations and sometimes symptoms of a sour stomach.

Coloptosis retards drainage and leads to fermentation, putrefaction and inflammation of the intestinal wall. Colonic toxins are more readily absorbed through an inflamed intestinal mucosa. The presence and severity of the symptoms of viceroptosis depends chiefly on the function of the organ, and organs involved, and not upon their position. It is when the emptying time or motility is impaired. It is due to the local action

of the bacteria and toxins, and the general toxemia, that the gastro-intestinal tract loses its tone with subsequent ptosis. High colonic treatments here are par-excellence, and after the auto-intoxication is overcome, we reestablish the tone of the gastro intestinal musculature, by stimulating the splanchnic nerve roots, opposite the seventh and eighth thoracic vertebrae. We do this with the Polysine Generator, using the slow sinusoidal wave at the rate of ten per minute. With the source of the toxemia removed, the motility and the tone of the intestinal musculature improved, and the function restored physiologically, the patient can be considered clinically cured, if not anatomically replaced.

RHEUMATISM

The treatement of chronic rheumatism, gout, St. Vitus Dance, arthritis, neuritis, painful and stiff muscles, migraine, neuralgias, may become satisfactory to physician and patient alike, if judicious colonic irrigation and colonic medication be applied in accordance with the demands of each individual case. Intestinal intoxication will cause eighty per cent of these conditions; and what could be more logical than to remove the toxic wastes, overcome the general toxemia, and restore the large intestines to normal function and vigor! If you want to administer salicylates or other anti-rheumatic medicines, you can plant them right down in cecum, and they will be absorbed without disturbing the stomach, and small intestines, or without interfering with the digestive mechanism.

SCIATICA

In the case of cecum infection where the inflammation extends low in the pelvis on the right side, the lumbar nerves that enter into the formation of the sciatic nerve may become involved in the infectious process; then we find a cause for some of those obstinate "sciatica" cases. These symptoms will clear up with cecal treatments.

MACBURNEY'S POINT

Many patients walk into a doctor's office, complaining of pain and tenderness in right lower quadrant. They hurriedly inform you that it is not appendicitis as they already have had their appendix removed. Adhesions are usually blamed for these symptoms, and so nothing is done to relieve the patient. Reports of some of our most prominent surgeons state that eighty per cent of so-called chronic appendicitis should not be operated upon. These conclusions were reached by post operative pathological examinations. The return of the same symptoms that preceded an appendectomy makes the patient feel, and the doctor possibly think, that the operation was not necessary. High colonic irrigations and colonic medication overcome a general infection in the cecum and the symptoms disappear.

ANEMIA

One of the most common causes of chronic anemia is a general toxemia. Toxins circulating in the blood not only have a direct destructive action upon the blood cells, but also eventually bring about defective blood formation, because of the gradual exhaustion of bone marrow, and the direct action of the toxins upon the liver, one of our chief blood-forming organs.

LIVER

We are concerned here in this paper with the liver, chiefly, because of its function in converting the nitrogenous matters that accumulate in the alimentary canal into urea. The burden of caring for the absorbed toxins from the bowel falls upon the liver. The constant and ever-increasing amount of toxins absorbed from the intestines sooner or later exhausts the secretory and detoxicative functions of the liver. Bile in the intestines is generally believed to act as an antiseptic. An active liver with a free flow of bile promotes pancreatic digestion; and the addition of bile to the protein solutions delays their decomposition. Bile, also, acts as nature's laxative. With the disturbed secretory function of the liver, all of these benefits are lost to a greater or less degree, with symptoms of indigestion, fermentation, putrefaction, constipation, and symptoms of absorbed toxins. When the detoxicatory function of the liver becomes sluggish, there is an inefficient transformation of the toxic protein wastes into urea, a nontoxic substance. This latter substance is excreted by the kidneys and represents about ninety per cent of the excretions of the protein wastes. A diminution in the detoxicating functions of the liver permits the diffusion of intestinal and toxic substances throughout the system with general deleterious results. A torpid liver with its abnormal inactivity or insufficient activity of the detoxicatory function is probably one of the chief causative factors in high blood pressure. A sluggish liver favors intestinal stasis and toxemia; and this toxemia further diminishes the activity of the liver, and in this way a vicious circle becomes established with an ever-increasing systemic toxemia.

The glycogenic function of the liver is disturbed, its detoxicating function is more or less suspended, metabolic poisons (acids) may not be properly neutralized, the resistance of the organisms becomes decidedly lowered, and the body exposed to bacterial invasion. The most logical way of activating the liver is to remove its burden by eliminating the absorption of toxic wastes from the bowel. Place the patient on a low protein diet, and give diathermy treatments directly through the liver to stimulate its detoxicatory and secretory powers.

CONSTIPATION

Bowel movements produced by laxatives and purgatives bring about a movement, but it is abnormal in functioning, especially upon the part of the intestinal glands. Bowel movements produced by food is the normal way; the passage of food through the canal excites a normal physiological reaction upon the secretory and motor functions. An adequate amount of bulky residue-containing foods, such as vegetables and fruit, is necessary to encourage natural movements of the bowels. The average person requires about two pounds of those foods daily. In the treatment of chronic constipation, we are learning that we can expect satisfactory results only in so far as we are able to influence and assist the physiological processes of the intestinal tract. Damage is done by the habitual use of cathartics, not by the occasional use when indicated in sickness. Purgatives by irritation stimulate the flow of mucus and increase the peristalsis of the bowels. The habitual use of strong purgatives usually removes good material along with the useless. They, also, encourage the tendency to lose the stimulus to reflex action.

It takes from two to three days normally for ingested food to reach the rectum. If a cathartic is taken today, and if it takes two to three days for food to travel from mouth to rectum, naturally one would not expect a natural movement for that length of time after a purge; but the patient desiring a movement a day becomes impatient and takes another cathartic, prolonging the natural movement another two or three days—thus the cathartic habit is started. This habit

never permits the bowels to fill and evacuate naturally, and a vicious circle is established.

When the colon becomes irritated by cathartics and then infected, it becomes spastic; and this frequently brings about reverse peristalsis which forces the bile back into the stomach, and the patient has a so-called "bilious spell." He, then, takes a drastic purge, such as calomel, and still another purge to follow that; and with great irritation and force, the stomach and intestines are cleaned out, with a resultant greater irritation in the intestines, and the same condition recurs. He, then, takes another course of elimination, and so still another vicious circle becomes established.

In prescribing bran, we advise but small quantities daily, as it is very acid, and if taken in large quantities serves as an irritant. It is now a recognized fact that in atonic constipation, the stimulation of peristalsis is of paramount importance. To accomplish this, it is not sufficient to introduce bulk. In chronic constipation the bulk is there, its outward drainage constitutes the problem. Roughage may secure a quick passage of ingested material through the intestines, but the nature and bulk of this roughage prevents the absorption of other material ingested with it, both because of inability of this food to come in contact with the mucous lining and because of its rapid passage. It is also wrong to overload a weak atonic colon with a lot of unabsorbable roughage, thereby increasing its work with a still further reduction of its tonicity. We always advise little bulk with adequate amount of water. When water is taken, it should be taken in frequent small amounts. Large quantities of water on an empty stomach stimulates peristalsis, and the greater amount of this water leaves the stomach unabsorbed and washes the food residue away before it can be absorbed. The amount of water drunk has no direct effect upon the consistency of the stools. Lying upon the left side favors drainage.

Too great a quantity of non-absorbable mineral oils accelerates the emptying time of the intestines which is not desirable. These oils are poor substitutes for the residue fruits and vegetables. When these cause distress, it is due rather to the irritated condition of the bowel. If this bowel soreness is very marked, it is wise to put them on a low residue diet, and give them mineral oils until the bowels are rested. Diathermy helps wonderfully, especially if there is much spasticity.

Degenerative changes take place in the intestinal walls, due to altered blood supply, increasing local infection, and the direct action of the poisons as they are absorbed. These pathological changes usually cause spasticity in the beginning, later the bowel becomes flaccid, losing its tone. Normally, the gastrointestinal tract is made up of firm yet soft elastic tissue, and the splenic and hepatic flexures have just the proper angle to permit a normal passage without friction and without delay. If ptosis occurs, the transverse colon drops down, and the angulations at these flexures become more acute, with a resulting delay in the passage of intestinal contents, irritation of the mucous membrane, and a derangement of normal peristalsis. Subsequently, the cecum and sigmoid lose ton, become distorted, distended, and impaction favored. The atony of the colonic involuntary muscles must be corrected, and the muscles must regain their tone to restore funtioning. Impaired musculature of the abdominal wall is also an important factor as, in this condition, the viscera lose the support that firm elastic abdominal muscles can maintain for them, and they tend to gravitate downward. Normal muscular activity must be restored after the intestinal toxemia is overcome, if intestinal stasis or constipation is to be permanently relieved. This result is obtained if the colonic irrigation treatments are followed by the use of sinusoidal wave currents. Sinusoidal treatments will strengthen the intestinal musculature and correct sluggish peristalsis, the blood circulation is stimulated so that congestions are promptly relieved, the secretory functions of the intestinal glands, pancreas, and liver are greatly enhanced, and the abdominal muscles are strengthened. The lymph circulation is forcibly augmented, which favors a more rapid absorption of food materials. There is also established a tendency toward a normal peristaltic rhythm. In certain cases diathermy should precede the sinusoidal treatments. The patients are always grateful in obtaining relief from their constipation.

TREATMENT

Treatment resolves itself into a low protein diet, a thorough cleansing and disinfection of the entire colon from the rectum up to and including the cecum, the instillation of medicaments, the implantation of Acidophilus Bacilli directly into the cecum, and then the restoration of the tonicity of the voluntary abdominal muscles as well as the involuntary colonic musculature.

Care should be taken that these injections be properly administered, which under no circumstances should be left to the inexperienced, as in most cases it will be improperly done. I know of no technic that requires greater skill, so beginners should first become well acquainted with the proper technic so as not only to prevent the discouragement of the patient, but also to avoid bringing discredit upon methods that, if well understood, are capable of obtaining all the way from amelioration of symptoms to complete relief and restoration of function.

Practice and experience alone will give one the necessary skill in high colonic work. It is, also, essential for the technician to have a complete knowledge of the physiology, anatomy, the chemical reaction and absorbability of any solution used, and certain conditions one may meet with during a treatment, such as: a transient sphincter gripping the tube, an inflamed, sensitive area, impacted feces, tube curling or bending upon itself, and difficulty in rounding an angulation. It is chiefly by the "feel" of the tube that these conditions are recognized.

Irrigations when properly given will not over-dilate the colon, in fact they bring about contraction by restoring their normal tone. The overloaded bowel is relieved, bacterial activity overcome, the hot solution stimulates circulation, abolishing blood stasis in the bowel walls, and the tube passing through the lumen stimulates the bowel musculature to contraction.

I have never experienced in my offices nor has it ever come to my attention elsewhere, of any untoward results or complic tions arising from the passage of these soft rubber tubes in the colon, so I feel safe in saying, if one uses proper technic there is no danger whatever in passing them.

TECHNIC

Overcoming colon infection, once most difficult, is now possible and cases respond readily to present day irrigation and instillation technic.

The irrigator as used in my clinic consists of three glass tanks, one of three and two of one gallon capacity. Each of these tanks is connected by rubber tubing to a three way valve. Petcocks are used to per-

mit any one of the tanks to empty its solution into the three way valve as desired. One prong of the valve is connected to the colon tube, the other to a commode. The inflow and outflow tubes have inserted in their course a piece of glass tubing for observation purposes.

The antiseptic solution in the three gallon tank is used in flushing the colon, cleansing it of feces and gas, and also facilitates advancing and placing the tube. In beginning an irrigation the patients are placed on their left side, left limb straight and right flexed. The end of the rubber tube is inserted into the rectum after lubricating well with heavy vaseline. Allow three or four ounces of solution to flow into the rectum and then out again, permitting the solution and gas to escape. Repeat this again and again until the return flow throw the tube is clear. Advance the tube gently but firmly a short distance while the solution is flowing in, then reverse the flow. Flush in and out again until the flow is clear, then advance the tube still farther and repeat the procedure. The solution distends the colon and opens up the folds and sacculations, favoring more thorough cleansing as well as permitting the tube to advance. Occasionally the tube will advance better as the fluid is flowing out, the peristaltic wave slipping over the tube. Advancing the tube with the inflow, however, is the rule.

When irrigating never allow more than a few ounces of solution to remain in the colon at a time. The object of the fluid is to open up the flexures, remove feces and gases from the rectum and sigmoid; the splenic flexure is then opened up, and the tube is advanced into the transverse colon. This latter portion of the colon is cleansed and syphoned off. The tube is then advanced around the hepatic flexure and advanced into the cecum. Always aim to reach the cecum, as this is the most favorable site for bacterial growth. After the tube is advanced beyond the sigmoid, the patients lie on their back to relieve the splenic flexure of the weight of gravity, and thereby aid the tube in rounding the splenic angle. Later, they are placed upon their right side to favor rounding the hepatic angle. This latter position is also best for your instillation of medicaments into the cecum, for if your tube is not entirely down into the cecum the solution will gravitate downward through the ascending colon and thereby enter the cecum.

As a rule we use a very soft tube in colons that are spastic; while in ptosed conditions we use a little stiffer tube as a soft tube tends to adapt itself to the intestinal loops and curves and is more difficult to pass in the latter conditions.

The inflowing solution dilates the colon immediately ahead of the tube, straightens out creases, folds, large and small invaginated areas, and releases mucus and small areas of retained feces. This enables the antiseptic solution to come in direct contact with the bacterial colonies growing upon the mucous membrane lining of the colon.

When the desire for expulsion begins, the valve is opened, allowing the fecal matter held in solution to flow out of the bowel. Cramps is also a signal to reverse the flow and as soon as the gas and solution are expelled, the cramps are relieved.

In the case of a spastic colon we apply colloidal silver solution at 40° C. The tube is passed between spasms. During a spasm the outflow must be left open and when relaxation occurs, the silver is permitted to flow in. If a spasm recurs the outflow is again thrown open and when the tube feels free, then the solution is turned in and the tube is passed rapidly as the feeling of clearance ahead of the tube permits. After the tube is beyond the spastic area do not advance any farther during this particular treatment, but plant your silver solution and remove the tube.

Never order an irritating cathartic as an aid when treating a spastic colon, use rather a very bland laxative. We use a tablet composed chiefly of liver salts; this keeps the feces in a softened condition and urges the liver on toward better functional activity.

After the cecum has been cleansed thoroughly we plant in the cecum about six ounces of sodium phosphate solution or eight ounces of concentrated epsom salts solution, and have the patient retain it as long as possible. The local action of these solutions cleanses the cecum thoroughly and then they are expelled in from five to ten minutes. The next day, after advancing the tube into the cecum, we plant therein about eight ounces of colloidal silver solution at 50° C. and this is retained as long as possible. Some patients will expel it in five minutes, others may retain it for several hours. There is very little of this solution absorbed. The action of the silver solution is to disinfect the bowel by killing off the putrefactive organisms and destroying their colonies; it, also, clears up any spasticity that may be present. (It is inadvisable to use hot solutions in heart cases and high blood pressure cases.)

The sodii phosphate solution and the silver solution are alternated for the first fourteen or more treatments or until we feel that the colonic tract is thoroughly cleansed and we have overcome the pathological bacteria. If we ceased our treatments here, it would be but a short time before the large colon would be as badly infected as before.

No matter how thoroughly the colon has been cleansed and disinfected, it does not remain clear for any length of time; therefore, the implantation of a nonputrefactive organism is of great value in attaining and preserving good health. With a luxuriant growth of B. Acidophilus in the cecum the benefits derived from these treatments should last over a period of years.

IMPLANTATION OF B. ACIDOPHILUS

At this time we advise our patients to take orally, regular daily amounts of Lacto-dextrin (Battle Creek Food Company), and for some of our cases we prescribe Acidophilus cultures by the mouth.

We give no cathartics unless absolutely necessary, and then prescribe a very mild laxative, one that has no antiseptic qualities. We use nothing but plain sterile water in our three gallon tank to advance the tube over to the cecum. About six to eight ounces of a sturdy strain of B. Acidophilus culture is planted in the cecum with the patient on the right side so gravity will aid in carrying the solution into the cecum. Patients remain on right side, lying quiet for about fifteen minutes, and then are permitted to get up, advising them to try to retain the culture. A total of eighteen or more of these plants are made until there is at least a forty or greater per cent growth in the cecum.

B. Bulgaricus has a quick and active fermentative value, the abundance of lactic acid thrown off has a sedative effect and quickly obtains a nontoxic absorption; but B. Bulgaricus life is short. A. B. Acidophilus growth is not obtained so rapidly, but when once established the growth continues indefinitely. It is impractical to try to change the intestinal flora by depending entirely upon the oral administration of Lactodextrin and cultures. It certainly would take months if it

changed it at all. One may obtain a good growth in the small intestines but not in the colon where it is needed. To obtain a good growth in the colon, the colon must first be properly prepared, toxic wastes must be removed, stasis must be overcome, putrefactive organisms must be eliminated and prevented from colonizing, then excellent results can be obtained with your Acidophilus implantation.

I will say that I certainly would prescribe Lactodextrin and culture by the mouth for a long period of time if that patient had no opportunity of obtaining the high colonic implantations.

CONCLUSIONS

High colonic implantations are now rational, effective and safe from untoward results. It is the most common sense way to combat intestinal auto-intoxication and other conditions which may have arisen because of colonic stasis and infection. The health and correct function of every organ in our system depends upon proper elimination of waste and toxic products. No matter what type of medication or other method be employed, until the local conditions in the colonic tract have been corrected, all such efforts can be, at best, but partially effective, and usually they will be a complete failure.

Irrigations are indicated in practically every diseased condition as they establish proper elimination, as well as remove a source of toxemia, thus aiding to a great extent any other treatment you prescribe to bring the patient back to good health.

Every modern hospital should have proper equipment and trained technicians to give these treatments. A course of high colonic irrigations and medications, with toning up of the voluntary and involuntary musculature, is not only valuable in cases of definite disease conditions, but it will greatly raise the health standard, even of those who do not look upon themselves as sick. It is the most efficient method of adding years to the span of life.

Ultra-Violet Light; from the Point of Positive and Negative Findings

By Varnum C. Southworth, M.D., Philadelphia, Pa.

It is the object of this paper to correlate the literature which has been written in the past, regarding the ultra-violet light, from a point of positive and negative findings, and also to state some findings which were worked out in the Department of Orthopedic Surgery at the University of Pennsylvania, and at the Widener Home for Crippled Children, in their Philadelphia winter home and in their summer home at Longport. It is my hope and endeavor to make this paper simple, plain, concise and full of facts.

For all practical purposes, the ultra-violet light rays are generated from three sources: the sun, the carbon arc lamp and the mercury vapor quartz lamp, sometimes spoken of as the Alpine sun lamp. To understand more fully just what we are dealing with, I am going to quote a few statements regarding the spectra of these lights and their comparison with other rays.

The standard of measurement for light rays is called the angstrom unit, which, for purposes of comparison, is one-ten-millionth of a millimeter; the gamma ray of radium is one-tenth angstrom unit. The X-ray is one angstrom unit, while the shortest known ultra-violet light rays are 136 angstrom units and the longest known ultra-violet rays, which are produced by the mercury vapor lamp, are 3,250,000 angstrom units. The shortest visible light rays are about 3,800 angstrom units, and the longest visible red rays in the solar spectrum are 7,500 angstrom units. Therefore, we will note that the majority of the ultra-violet light rays are at one end of the spectrum, while the red, or the infra-red rays, commonly known as the heat rays, are at the other end of the spectrum.

The most complete spectrum is that produced by the sun, which has all the natural rays possible. The carbon arc lamp and the mercury vapor lamp give a shorter spectrum, and are, therefore, not as effective.

SUNLIGHT

It has been conclusively proven that there are several factors which effect the sun's spectrum. In cities and towns where the dust and smoke in the atmosphere is heavy, a great many of the shorter ultra-violet rays are absorbed by these invisible particles. It has also been proven that sunlight is not effective in small amounts on rats until the sun has reached an angle of sixty-two degrees with the earth. In the vicinity in which this experiment was worked, this occurred about 10:51 in the morning and lasted until a little after three in the afternoon, the reason for this being that during the early morning hours and late afternoon hours, the sun travels through a much more dense atmosphere. However, it has been found for some diseases, such as rickets, that the rays earlier in the morning and later in the afternoon are very effective on children, and because of the intensity of the heat during the hours above mentioned, they state that children, and patients in particular, should not be exposed to the midday sun, and that they can derive the necessary results looked for by the earlier morning and late afternoon exposures. In my private practise and clinical experience, my results have been such with patients that I was able to understand their point of view. Of course, the strength of the sun's rays varies again with the seasons of the year, but it has been found that even in December there are enough ultro-violet light rays to prevent rickets, when there is not too much dust in the air.

It was found in Chicago that, even on the tops of some of the higher buildings, due to smoke and dust, the rays of the February sun did not have enough ultra-violet quality to be worth much for medicinal purposes. I, personally, have had no experience with this glass.

It has also been found that the sun's rays are supposedly stronger in the high mountainous districts than they are at the seashore. But, nevertheless, it has been definitely shown that many cases do very well under regulated exposure, though the day be cloudy or foggy. Anyone who has tanned with the summer sun and burning asmosphere of the seashore will readily recall how burned he has become on days that were quite cloudy. I might state here that the burning effects and the tanning effects are usually produced by the longer rays, and the shorter rays are more readily absorbed by fog and dust particles. The shorter rays are absorbed by the epidermal layers of the skin, and the longer rays have a relatively greater penetrative power.

The next best substitute for the sun is the carbon arc light when it follows these principles. The carbon arc light has a full spectrum (but a short spectrum) and it will give the desired results. One reason why, in so many cases, results are not collaborated, is because the spectrum is too short. According to good authorities, it is necessary for a carbon arc lamp to form a crater and this crater should be on the upper carbon pole so that the white heat rays which are developed will be cast down on the patient rather than at the ceiling. The smaller the carbon electrodes are within a certain diameter, the more effective is the light. The carbon should be unequal in diameter and the larger carbon in the upper pole. In using metal electrodes, the fumes evolved are very unpleasant, therefore, the hollow carbons or the carbons with metallic substance in them are much preferred. It has also been found that, in using a very high voltage and an alternating electric current, the necessary spectrum is not as large as where a direct fifty-five volt current is used.

A great deal of the carbon arc treatments have been developed at the Finsen Institute at Copenhagen, and it is just recently that the carbon arc light has penetrated this country. I am not speaking of the infra-red carbon lamp, which, so far as I have been able to determine, is excellent for the production of heat rays, only I do not mean to commit myself in any way regarding its curative power, but have, at the present time, a few of the experiments in mind whereby I shall be able to compare the infra-red ray, the Tungsten heat lamp, and our good old-fashioned but ever reliable gas and electric baker. Skin tuberculosis, surgical tuberculosis and throat tuberculosis have been successfully treated by the experiments with carbon arc lights, but to date I am not able to find any definite data to show that pulmonary tuberculosis is improved or injured. I believe that it is up to all of us to consci-

entiously and carefully feel our way and expand the use of the light, not with the idea that it is a cure-all, but with the idea that light treatments may have a certain definite effect upon disease.

THE MERCURY VAPOR LAMP

There are three main types of mercury vapor light now on the market, made by the Victor X-ray Corporation, The Burdick Corporation, and the Hanovia. Two of these lamps have almost identically same burners, while the third has an angulated burner. Some of the lamps are reputed as being stronger than others, but that is a matter of salesmanship, which I hesitate in discussing. The spectrum of the mercury vapor lamp is of the least value, in that it does not have a great sufficiency of the infra-red and tanning rays (therefore it does not have a complete spectrum). It is the most used in the country and has had, in the past, a very wide distribution, so much so that it has been recommended for the private home and the promiscuous treatment of almost every disease. When I came to the University of Pennsylvania, I began a series of experiments with cod liver oil and the ultra-violet light, to prove or disprove the facts that we have often heard as to the wonderful value that devolves from the ultra-violet quartz light and cod liver oil when treated by it. So it was this idea that started the experiment on a series of cases of twenty children. These children were picked at random out of Ward L, and consisted of multiple abscess of the hip, cervical Pott's disease, infantile paralysis, sub-acute stage, tuberculosis of the knee, scoliosis, in which bone transplanting had been performed, and so-called idiopathic hydrops of the knee.

Technique: Each patient was treated daily with the ultra-violet quartz light, Burdick make. The minute dose was used for brunettes and half a minute dose for blonds. This was increased one minute daily, unless there was a red reaction the previous day. When the patient was receiving thirty minutes quartz light anteriorly and posteriorly, the light treatment was held constant. During this time all the children were permitted out in the sunlight as much as possible.

Fresh cod liver oil was placed in a large shallow basin and exposed to the ultra-violet quartz light for a period of thirty minutes, with the light at a distance of twenty inches. We then attempted to take two children, each with the same diagnosis, and give one the light treated cod liver oil and the other one the plain cod liver oil. Every two weeks the red blood cell counts and the haemoglobins were taken. The weights were also taken but were not accurate because of the change in casts. These experiments were continued over a period of five months.

It is not very easy to note the end results, because there was very little difference in the reactions. However, there were a few things that did seem to stand out. In those children receiving the treated cod liver oil, the haemoglobin content invariably fell in percentage. Some of the children fell off as much as ten per cent in the first few weeks, then there was a gradual rise, until the haemoglobin reached its original height, and then a very slow rise upward; but at no time did any of the children get higher than ninety-one per cent. Invariably there was a rise in the red blood cell count for the first three weeks, and then a gradual decline. Perhaps this increase in the red blood cells accounted for the decline of the haemoglobin.

The children being given the untreated cod liver oil showed an increase in the haemoglobin, and a gradual increase in the red blood cells for the first four weeks, then there was a marked drop in both haemoglobin and red blood cells. This drop averaged about four hundred thousand cells. After three to five weeks the haemoglobin and red blood cells again took a spurt and were gradually on the increase until the child was up between eighty-five and ninety per cent in haemoglobin, and over four million in red cell count.

The cases which showed the greatest improvements were those which had been operated upon or those which had had an acute infectious disease, such as infantile paralysis. In these cases (regardless of whether the oil had been previously treated with the quartz light) they seemed to improve rapidly under the light and cod liver oil. The weight of the children gradually increased but was not any more marked than would be expected in a normally growing child. Those children who had come into the hospital quite emaciated and markedly undernourished showed rapid improvement which, I believe, they would have shown regardless of the ultra-violet light treated cod liver oil.

I think it is rather interesting to note that, while these children were under this light treatment, one of them developed pneumonia and another one developed diphtheria, and several of the children had chicken pox. These infections came on in spite of the fact that they were daily treated with the ultra-violet quartz light and on all bright days were exposed to the sunlight.

At no time was I able to produce the tanning effect and a deposit of pigmentation upon the children without the aid and the cooperation of the sun. After the time that I compared these experiments, there was some very interesting chemistry drawn upon the blood which showed that, after several treatments of the ultra-violet light, the bacteriacidal power of the blood was reduced, and that there was some tendency, too, for the child to be more susceptible to infection. Enough for the rather detrimental side of the ultra-violet light and let me say that I have definitely found it to be beneficial in the local treatment of ulcers, carbuncles, and a great many skin diseases, including a very spectacular case of hair-follicle infection, which had, for many years, been treated by several men of this country and Scotland, with almost every known method of treatment. This person had been X-rayed to the point where he was almost beardless, only to have the whiskers appear again and remain infected at the roots, forming a generally honeycombed scab not unlike the scabs of impetiago contagiosa. In this case the type lamp called the kromyer water-cooled was used, and after several very short applications we were able to see some definite improvement, and when last known, the patient was still entirely free from infection. In cases where granulation is desired, and the assistance of the growth of new skin, the quartz light is splendid, because the exact dosage and treatment can be regulated and the lamp can be moved to the bedside.

Therefore, in conclusion, let me recall to your minds again that the sun with its complete spectrum is the best form of light, that the restricted carbon lights have a definite place in medicine, and that last of all, the mercury vapor lamp which has been so widely advocated in this country is like all other fads, it must be used with conscientious understanding, therefore let us go about our work with an open but cautious mind.

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Abstracts

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Arthritis. By Ralph Pemberton, M.D., Chairman of the American Committee for the Control of Rheumatism, visiting physician, Presbyterian Hospital, Philadelphia; in Amer. J. Med. Sc., CLXXVIII:5:593-605, November, 1929. (Mary Scott Newbold Lecture delivered at the College of Physicians, Phila., Nov. 7, 1928.)

Treatment must take the direction of removing possible causes. Infectious diseases do not constitute the whole picture, however. The duty of the practitioner has only begun in most cases when abscessed teeth are removed or a boggy prostate is massaged. There remains in chronic arthritis, following the removal of even causative infections, a more or less chronic dislocation of physiology which may persist a long time or even permanently. In this connection one of the most useful lessons ever adduced has come from the Boston orthopedists who have developed a viewpoint of much wider value than the term orthopedic implies. This has to do with the rehabilitation of the deranged physiology in the chronic arthritic as the structurally inferior subject.

One of the most important measures to be instituted early in the treatment of the disease is rest. By this is meant systemic rest of the body as a whole and not necessarily rest of the affected part. It is the belief of some of the most qualified observers that, in general, rest of the joint in atrophic arthritis is not desirable, whereas in hypertrophic arthritis rest of the joint affords removal of one of the causative etiologic factors.

Apart from the significance of rest as a specific measure, it has another importance in relation to various other forms of treatment, especially Physiotherapy. Rest must be used in extra dosage, so to speak, when demands are being made upon the organism to respond to various therapeutic procedures, nearly all of which exact their toll of fatigue.

Perhaps the oldest, and certainly one of the most important categories into which treatment of the arthritic must fall, is that of Physiotherapy—massage and heat. Mention must be made of vaccine therapy and the use of non-specific protein. Their place in arthritis is established in relation to one exciting factor of the disease.

Apart from the question of local foci, such as an infected gall bladder or ulcerative colitis, the intestinal tract plays unquestionably a large role dependent upon the still unmapped processes of fragmentation of the foodstuffs and the formation of the products of normal bacteriologic activity. There can be no question but that through colonic irrigation we have a means of removing or modifying one of the great causative factors of arthritis.

If there be value in expediting out of the gastro-intestinal canal its complicated and varied contents, it should and does follow that control of the intake of the substances thus sought to be expedited should also be important. The form which it takes is chiefly in the direction of a lowered caloric intake at large, though there is reason to believe that the starches and sweets are more deleterious than the other foodstuffs.

The field of drug therapy, in general, has limited value in the arthritic syndrome. Heading the list as regards relief of pain are the salicylates only to afford temporary comfort and they may have undesirable sequences. Superseding the salicylates in value is arsenic.

Treatment of the arthritic should be somewhat analogous to the training of an athlete. Professional trainers are unanimous as to the importance of a carefully balanced program for their charges. The athlete never runs when he is tired and he rests after his run. Massage further contributes to the efficiency of his normal muscular physiology.

Arthritis: Some Salient Points as to Its Causation, Symptomatology and Therapeusis. By Henry Keller, M.D., Attending Orthopedic Surgeon at the Neurological, Community, and West Side Hospitals, etc., New York, N. Y., in Internat'l J. M. & S., 42:9:443-444: Sept., 1929.

In acute conditions rest is indicated, and in order to rest an acute joint the muscle groups in relation to the joint must not be ignored.

In subacute conditions, limited gentle massage followed by active motion instituted by the patient himself is advisable. Massage, however, should never be given for a long period or vigorously in subacute cases, and should always be followed by splinting of the involved parts—otherwise greater contractures of the already contracted muscles usually ensue.

In a very interesting discussion on massage, exercise and remedial movements in relation to auto-inoculation, Crowe shows the danger of massage in the early cases because of the possibility of auto-inoculation through the squeezing out of microbes into the general circulation, or the increased flow of blood to the part may disseminate the germs and produce an intensified reaction. He, therefore, advocates that the massaging be postponed until the patient tolerates large doses of vaccine without any reaction whatever. Massage, however, must never be given on the same day with or on the day following a dose of vaccine. As the pain subsides other physiotherapeutic methods can be instituted, such as: Hydrotherapy, helotherapy, ionization, diathermy.

All these methods are of great importance provided they are carefully controlled under supervision of a properly trained physician in this line of work, as great harm can occur from physiotherapeutic procedures when applied by untrained and unskilled men.

OPERATIVE TREATMENT

Operative treatment is with few exceptions contraindicated in the acute and subacute stages, and should be reserved solely for chronic athritis, when the disease has spent itself and the deformities are amenable to correction.

Treatment of Asthma by Ultraviolet Irradiation. By J. Saidman in Archives Med.-Chir., l'App. Resp., Paris, 3:480: Dec. 1928; abst. in Jour. A. M. A., 93:11: 880: Sept. 14, 1929.

Saidman reports that in ten cases of bronchial asthma in children, the reaction to ultraviolet irradiation was favorable. The percentage of success is higher in older children than in infants aged less than 3 years. The indications for actinotherapy are of importance. Saidman considers the treatment particularly effective in cases in which enlarged tracheobronchial lymph nodes or bronchitis is present. In the adult the improvement fol-

lowing ultraviolet irradiation is not so marked, although with more intensive treatment patients have shown latent periods of from several months to three years. However, recurrences occurred following colds, ovarian congestion and, in one case, vaccination. Patients with emphysema exhibit distinct improvement of the dyspnea, even when the dyspnea is of tuberculosis origin. Saidman considers the action of ultraviolet rays as originating from the effect of the irradiation on the sympathetic nervous system, and secondly as liberating certain substances of the skin which may act as protein therapeutic agents. A third effect of the ultraviolet rays consists in direct action on the bronchial foci. The technic of application consists in the timed use of an arc lamp at a certain distance, gaged by a sensitivity test. Saidman advocates a series of twenty irradiations (exposure every second or third day) for children. With adults the ultraviolet irradiation should be supplemented by medication. Its effect is that of a sedative and tonic.

Action of Ultraviolet Rays on Regeneration of Blood and on Iron Metabolism. By S. Osato and S. Tanaka in Zeitschr f. d. Ges. Exp. M., 65:692: May 29, 1929; abst. in Jour. A. M. A., 93:11:886:Sept. 14, 1929.

In experiments on dogs, guinea pigs and white rats, Osato and Tanaka found that moderate ultraviolet irradiation causes marked regeneration of blood not only in normal animals rendered anaemic by venesection but also in splenectomized anaemic animals. In the regeneration of blood the reserve iron is mobilized from the liver and spleen in normal animals and from the liver in splenectomized animals.

The Modern Conception of the Use and Value of Cod Liver Oil and Ultraviolet Ray Therapy in the Care of Children. By N. O. Pearce, M. D., Assistant Professor of Pediatrics, Medical School of the Univ. of Minnesota, in The Journal-Lancet, xlix:17:391-396: Sept. 1, 1929, and Sept. 15, page 418.

Aside from the treatment of rickets and tetany we have obtained our most brilliant results with ultraviolet ray in those cases where children are suffering from malnutrition, poor appetite, and fatigue, associated with repeated and lasting upper respiratory infection, especially in the winter months. Some excellent results have been reported in the irradiation of patients who are slow in recovering from pertussis.

As in the dosage of cod liver oil the dosage of ultraviolet ray exposure is difficult to determine.

In the writer's experience there is no better disguise for the taste of the cod liver oil than to mix it with orange juice.

In considering the dosage of cod liver oil we should approach the matter from purely the vitamin A and vitamin D content, as these are the only essential constituents of cod liver oil which are not obtainable in some other form of fat more palatable. Certain standards of vitamin content have been set up by the U. S. P. These, however, are comparatively low, the U. S. P. vitamin A content requirement being only 50 units per gram, while a good quality cod liver oil will contain at least 500 units per gram. The vitamin D content is not set up in the U. S. P., but a good oil contains 112 units per gram or 3,000 per ounce.

We have evidence that prematures need much larger amounts of cod liver oil than full-term babies, and in many of these it is impossible to give sufficient cod liver oil to prevent rickets.

From the writer's experience it would be difficult indeed to set either a minimum or maximum dosage of cod liver oil necessary to prevent rickets in the average infant. There are some reports in the literature of certain pathology which has developed from overdosages of cod liver oil, particularly a hypermineralization and some degeneration in the heart muscle. However, the danger of over dosage with the normal cod liver oil preparation is comparatively slight because it is rare indeed that a child's stomach will tolerate beyond a very reasonable amount.

Methods of direct sun exposure in use for children which we believe are more practical with infants are as follows: The child should be exposed on a cot, bench, table, or on the floor in the direct sunlight each day. The first day expose, stripped, one and one half minutes front and one and one half minutes back; the second day, three minutes front and three minutes back; the third day, four and a half minutes front and four and a half minutes back; etc., increasing one and a half minutes front and back each day until the baby is being exposed for thirty minutes, fifteen minutes front and fifteen minutes back.

The exposure should be made on a white sheet or blanket which will reflect the rays and which will add much to the intensity of the treatment. It is not practical to keep children quiet much longer than this, and I believe that the tendency today is to over-irradiate than to under-expose.

In the use of ultraviolet therapy various types of window glass and window glass substitutes are offered. Ordinary window glass, even of the thinnest variety, shuts out all rays under 3,100. The best substitute is a fused quartz which transmits an average of 92 per cent at a thickness of 4.7 millimeters. The second glass of value is known as Corex, which at a thickness of 2.8 millimeters transmits 89 per cent. These two glasses, however, are so expensive as to make them impractical for ordinary home use. From these we drop to glasses sold under the trade names of Heloglass, transmitting 56 per cent, Vitaglas, transmitting 44 per cent, and Celloglass, transmitting 30 per cent.

We, in this region, should also consider that during that part of the year in which it is necessary to use a glass protection from the outside air there is not a large amount of therapeutic ultraviolet ray in the sunlight. In simple terms the various kinds of apparatus may be divided into the mercury vapor quartz lamp type and the carbon arc lamp type.

The mercury vapor quartz lamp, I believe, is the one of choice for office practice where the length of time of exposure, the space occupied, and the number of patients to be treated are of importance. As stated before, the tendency to over-expose is very great. For a tonic effect and for the treatment of rickets and tetany a suberythema dose is the one choice. The longer experience we have in the use of this type of lamp, the more we are convinced of the efficiency of short exposures at not too frequent intervals. It is the practice in my office to give exposures three times weekly, with the lamp at 30 inches from the skin—1 minute front and 1 minute back first day, increasing the time gradually at each exposure until 15 minutes front and 15 minutes back are reached on the tenth treatment.

Experiments have shown that either cod liver oil or ultraviolet ray will cure rickets, but that when both are given, the return to normal is more rapid. Much has been written of the value of ultraviolet ray therapy in the treatment of surgical tuberculosis, and those who have had wide experience believe that it is almost a specific.

Now, coming to the other type of artificial ultraviolet

producing apparatus, that is, the carbon arc lamp, there are a great variety of these on the market, all of which probably have some virtue, but none of which can be said from a practical therapeutic standpoint to have the qualities of the mercury vapor quartz burners.

CONCLUSION

First, every child born in this region and untreated will probably develop rickets to some degree at some time during the first year of life.

Second, cod liver oil depending on vitamin A and vitamin D content should be given to all infants during the winter months to the amount of from one to three teaspoonfuls daily.

Third, sunbaths during the summer are a simple, practical, and efficient method for promoting growth, increasing natural resistance and preventing rickets and should be advised for every child during infancy and early childhood.

Fourth, the mercury vapor quartz lamps are a valuable therapeutic agent and may well be included in the office equipment of every physician.

Fifth, the carbon arc lamps, while more limited as to therapeutic value may well be used in the home for the general tonic effect, especially lamps of good construction, burning the sunshine A carbon.

An Apparatus for Mass Treatment of Children With Ultra-Violet Rays. By Benjamin Goldberg, M. D., Chicago, in Jour. A. M. A., 93:18:1377, Nov. 2, 1929.

The first installation designed was for the Spalding School for Crippled Children. A carbon arc unit was first considered. The idea, however, was discarded because of the fact that, according to city ordinance, each carbon arc unit must have an operator in charge. In addition, the amount of heat generated by a carbon arc unit is very large and the treatment period, as time went on, would necessitate long exposure. It was decided finally to make use of mercury quartz lamps combined in one unit in such a way as to meet the needs of the crippled children.

The "sun room" was elevated about 15 inches from the floor and approached at both ends by ramps, 6 feet in length, graded 2½ inches to the foot. The room is open at each end and a conveyor, on the endless chain principle, runs its entire length.

On each side of the chamber, or sun room, 2½ feet from the floor, are placed three Uviarc lamps, making a total unit strength of six mercury quartz lamps.

In order to maintain a comfortable temperature level, exhaust fans have been installed at the top of the chamber.

Calcium Content of the Blood of Pregnant Women Following Ultra-Violet Irradiation. By H. Guthmann and W. Schol in Strahlentherapie, 33:348: July 23, 1929; abstract in Jour. A. M. A., 93:15:1184: Oct. 12, 1929.

In a study of the calcium content of the blood of forty-eight pregnant women before and after ultra-violet irradiation, Guthmann and Schol noted that, instead of the decrease in the calcium content that is present normally, the calcium content of the blood of pregnant women was increased following roentgen examination. This increase in the calcium content of the blood is of great importance prophylactically, because, as a result of it, the development of various diseases, such as subtetany and osteomalacia, is prevented and the severity of other diseases, such as eclampsia and nephropathy, is diminished. It is probable that the favorable action of ultra-violet irradiation of parents with preeclampsia is the result of the regulation of the calcium content of the blood. The authors believe that the systematic ultra-violet irradiation of pregnant women is to be recommended as a routine procedure.

Quartz Light Therapy in Pulmonary Tuberculosis. By F. E. O'Brien in N. E. J. of M., 201:403: Aug. 29, 1929; abstract in Jour. A. M. A., 93:13:1024: Sept. 29, 1929.

O'Brien has found artificial heliotherapy combined with sanatorium treatment routine a valuable adjunct in the treatment of pulmonary tuberculosis. He says that it is an effective aid in assisting the reduction of temperature and building up the general resistance of the patient. The very far advanced cases with high temperature do not gain any advantage in artificial heliotherapy because of effort required in treatment. Hemoptysis is not a contra-indication to artificial heliotherapy. Artificial heliotherapy without rest treatment would not be very beneficial in pulmonary tuberculosis. A marked decrease in lung moisture and decrease in severity of cough is especially noticeable with quartz light therapy. There is no advantage in producing erythema in treatment, and gradual tanning is not necessary. Artificial heliotherapy has a sedative effect on the patient. It assists the natural healing processes in tuberculosis by assisting expectoration in the beginning and later in reducing the amount.

Sinus Diseases in Children. By V. W. Fischbach, M. D., Cincinnati, Ohio, in Ohio Med. Jour., 25:10:796-797: October, 1929.

Ultra-violet irradiation continued over the winter months, with direct heliotherapy in the summer, is one of our best helps, and with the carbon arcs now made, at a reasonable price, home treatment can be had by the majority.

The prophylactic care of children consists of the diet regulation, as stated, with the use of cod liver oil to increase the vitamin content.

General care must be taken to prevent against excessive exposure and fatigue. The use of sunlight therapy as a routine during the winter months is one of our best assets.

Lastly, the prevention of acute infections is very important.

Treatment of Acne Vulgaris With Small Doses of Quartz Lamp Radiation. By A. Korsbjerg in Ugeskrift f. Laeger, 94:568: July 4, 1929; abstract in Jour. A. M. A., 93:13:1036: Sept. 28, 1929.

Korsbjerg asserts that this treatment of common acne seems superior to methods of treatment previously employed, as to both efficacy and ease of application.

Carbon Arc Versus Quartz Lamp in Dermatologic Therapeutics. By Moses Scholtz, M. D., Los Angeles, in Cal. & West. Med., 31:3:183-186: September, 1929.

Dermatoses submitted to radiation were those in which only mild actinic stimulation was indicated.

Speaking generally, the clinical results were fully equal to those from the quartz burner.

The quartz lamp is capable of producing a quick and intense actinic effect, characteristic of short ultra-violet rays, but of very little penetration. On the other hand, the carbon arc is also capable of obtaining the actinic skin effects sought for in dermatologic therapeutics, though at a somewhat slower rate, and in addition obtains side effects, due to the long-waved rays of

the infra-red and violet visible zones. This clinical observation is readily substantiated by theoretical data supplied by physicists that bactericidal property is possessed by the rays up to 3600 A. U., and that the tanning and erythema-producing property is possessed by the rays up to 3200 A. U.

The presence of deep penetrating infra-red and other rays gives an unquestionable clinical advantage to the carbon arc over the quartz lamp in dermatoses with a systemic background.

To be more specific, the carbon arc seems to be preferable in all cases in which a mild, prolonged and sustained actinic radiation is desired; for example, in babies and young children, blond and fair complexioned individuals with tender and radio-sensitive skin, such as the face, neck, genitocrural region, inner sides of the thighs, etc. Also exudative, vesicular, acutely inflammatory and highly irritable dermatoses, such as weepy or impetiginous eczemas and various forms of streptococcic dermatoses, tolerate the carbon arc better than the quartz lamp. The major indication of carbon arc is the systemic character of dermatoses. This encompasses the enormous clinical group, composing metabolic and dietetic eczemas, lichen planus, Duhring's disease, senile pruritus, acute generalized sporiasis, generalized and localized tuberculides, dermatoses associated with anemia, malnutrition, sluggish metabolism, etc. The carbon arc has proved to be very desirable as supplementary treatment in acne, general seborrhea, generalized sclerodermas, and atrophodermas. On the other hand, the quartz lamp would seem to be preferred in cases where localized intense actinic radiation for a blistering or desquamating effect is desired, such as in patchy alopecia areata, plantar and palmar dry, scaly, trichophytic dermatoses, sluggish chronic circumscribed psoriasis, and discoid patches of lupus erythematosus.

Ophthalmic Light Therapy. (Read before the Louisiana State Medical Society, New Orleans, Apr. 9-11, 1929.) By Chas. A. Bahn, M. D., New Orleans, in New Orleans M. & S. J., 82: 3: 144-148: September, 1929.

The lamp that has been most frequently used in ophthalmic ultar-violet therapy is the irradiation lamp of Birch-Hirschfield, which has been employed in our series of 106 cases. Being of the arc type, both long and short wave lengths in profusion are transmitted, requiring filters which will absorb, in a great part, all the wave lengths down to around 3,000 A. U.

In affections of the lids, local phototherapy has been used, apparently with benefit in herpetic and tuberculous disease, eczematous affections, chalazia, hordeola and as a preventive of infection extension following injury.

In the conjunctiva it has been more frequently used in blepharo-conjunctivitis, trachoma, vernal conjunctivitis, and phlyctenular disease, especially involving the limbus.

In affections of the sclera, especially of tuberculous origin, ulta-violet therapy seems to be regarded as a valuable adjunct to other treatment.

In the herpetiform group of corneal affections characterized by variable loss of substance, delayed healing, diminished sensitiveness and negative explanatory bacterial findings, especially in the incipient stages, this form of therapy apparently finds its most successful application. The use of a properly prepared two per cent fluorescein or one per cent congo red solution apparently accentuates the intensity of its effect. Based upon our experience I would unquestionably desire this form of therapy used upon me, especially if I had herpetic disease or beginning serpigenous ulcer.

In the dystrophic group of corneal affections, phototherapy also finds a logical application and has been recorded in the literature rather favorably in the treatment of these otherwise progressive conditions.

Bodily light baths under reasonable supervision are an important adjunct to other treatment in numerous bodily diseases which directly or indirectly affect the eyes and are especially indicated in children with deficiency of bodily development and nutrition.

Sunlight for this purpose is at least the equal in therapeutic value of any artificial light.

Ultra-violet ocular therapy is a valuable adjunct to other treatment, especially in certain types of superficial diseases involving infection or delayed cell reproduction and recovery, such as the herpetiform affections and dystrophies.

The most promising field for ultra-violet ocular therapy apparently lies in the prevention or arrest of infected ulcers and herpes and in its early use following injuries showing the first signs of delayed healing.

The use of analin dyes in ulcerative affections immediately prior to ultra-violet treatment apparently markedly accentuates its therapeutic effect.

Especially in pneumococcal corneal ulcers, light treatment alone cannot be depended upon sufficiently to justify its exclusive use, but should be used with other treatments.

Infra-red ocular therapy is, we believe, the most pleasant form of heat application and is an excellent analgesic in all painful and inflammatory ocular affections.

Diathermy as Adjunct in Treatment of Pelvic Inflammatory Disease. By L. C. Sheffey and W. H. Schmidt in American J. Obst. and Gynec., 18:230: Aug., 1929; abstract in Jour. A. M. A., 93:12: Sept. 21, 1929.

Sheffey and Schmidt believe that whatever good diathermy accomplishes is due to the increase in circulation brought about by the local application of heat, rather than from any heat generated in the diseased tissues themselves, and surely not from any destruction of bacteria by heat. They do not agree with some observers that it should be employed in all cases of inflammatory disease, irrespective of the severity of the infection and the degree of pelvic disease. Its use is contra-indicated in the presence of complicated pelvic conditions as myoma uteri and ovarian cysts or tumors, nor should it be employed during menstruation or in the presence of profuse bleeding of inflammatory origin. They did not find, as did some observers, that pain was almost instantly relieved by its use. Sometimes it was increased for a time at least, and if markedly so, the applications were discontinued. Less technical difficulty was noted, however, in the operative cases preceded by diathermy, as evidenced by decreased density of adhesions and their more ready separation. They were better satisfied with the use of the abdominosacral method than with the abdominovaginal, the application being simpler, and because of their belief that increased circulation is the principal factor in the benefit derived, rather than increased temperature in the tissues themselves which one might more likely expect a vaginal electrode to produce.

Artificial Fever Produced by High Frequency Currents. By Clarence A. Neymann, A. B., M. D., and S. L. Osborne, B. P. E., Chicago, in Illinois M. J., LVI:3:203, September, 1929.

These authors say in conclusion that:

1. Fever can be produced by high frequency currents.

2. Dangers from this form of treatment are encountered by too great and too sudden a density of current and improper contact between the body and electrodes. These dangers can be largely overcome by perfected technique.

3. However, there may be another danger which cannot be obviated. The anatomical structure between the electrodes may be such that high densities of current are obtained, causing probable high local rises in temperature. Whether these rises are above physiological limits further experiment must determine.

Injuries to the Back. Economic aspect in industrial cases. Reports of cases. By Halbert W. Chappel, M. D., Los Angeles, in Calif. and West. Med., 31:3:180-182: September, 1929.

Following strains or sprains of the back, there are various degrees of stiffness. This limitation of motion is due to an inflammatory reaction, which must be prevented from forming strong bands of fibrous tissue in the injured back as the result of the effusion of blood and serum, or prolonging rest until the obstructive bands matured, or by adding injury, by too early passive movement, to the existing early state of repair.

Muscle power cannot be regained as long as the muscle is in any way deprived of its full opportunity for painless movement. It is by a proper combination of rest, muscle relaxation (often by passive means), and muscle action that the injured back recovers its normal range of painless motion. Therefore, the one very essential thing to recovery is voluntary effort on the part of the patient. It is of utmost importance to impress on him clearly the fact that his recovery depends entirely on his own persistent and accurate effort. As purely voluntary movements rarely allow a range sufficient to cause pain, the patient may repeat the attempted movements immediately and at frequent intervals during the day, resulting usually in rapid and complete recovery.

The routine treatment of prolonged rest in bed, baking, girdles, braces, plaster jackets, extension in bed, and orders not to move, proclaim to the patient that all back injuries are very serious and may never get well. Besides, the back stiffens, movements are painful, and morale becomes very low. Then the insurance company must treat a chronic condition which should have been avoided. Passive treatment of back injuries is a very common but a very expensive method.

Value of Physical Exercises in Treatment of Diabetes Mellitus in Children. By F. Hamburger in Mun. Med. Wchnschr., 76:1329: Aug. 9, 1929; abst., Jour. A. M. A., 93:18:1426: Nov. 2, 1929.

In treating a child with diabetes mellitus, Hamburger noted that in the urine which was secreted during the day the sugar content was considerably less than it was in the night urine. This is explained as being due to the influence of exercise during the day. During physical exertion the normal person as well as the diabetic patient is able to oxidize a larger quantity of sugar than during a period of rest. Accordingly the author introduced physical exercise into the therapy of the diabetic child and found that the sugar was utilized to greater advantage and that the child felt much better. Comparatively large quantities of carbohydrates could be given without insulin injections, and still the excretion of sugar was minimal. The author then reviews the literature and finds that several other authorities likewise stress the value of physical exercise in the treatment of diabetes mellitus. Diet, insulin and exercise are indicated as the three main factors in the therapy of this disease. It is further pointed out that in cases of diabetes mellitus in children it is advisable to test the urine in separate portions rather than to examine the mixed urine that has been secreted during 24 hours. This will give a clearer insight into the actual conditions, and at the same time it will give indications for the best therapeutic method. The author suggests the following as an effective treatment:

The child is given insulin injections until its general condition has been improved to such an extent that light exercises may be undertaken. Physical exercises such as walking, climbing, running and gymnastics are then gradually increased and the use of insulin is gradually discontinued. Before greater exertions, insulin is not to be given. The daily routine may be arranged in this manner: In the morning the patient receives a large amount of carbohydrates and he should exercise as much as possible. Insulin should not be given. The noon meal should supply mostly fats and proteins. In the afternoon a small amount of carbohydrates is permissible and a limited amount of insulin. In the evening, carbohydrates and insulin may be given in larger quantities.

Physiotherapy as a Part of the Nursing Curriculum. By Jessie L. Stevenson, R. N., Supervisor, Orthopedic Div., Visiting Nurse Assoc., of Chicago, in Modern Hosp., 33:4:126-128, October, 1929.

The installation of Physiotherapy departments and the demand for workers have grown faster than the supply of trained technicians to meet that demand. This fact, together with a lack of understanding of the training necessary for such work on the part of those engaging the workers, has led to the employment of inadequately trained people even by reputable hospitals. Naturally the result has been to discredit Physiotherapy treatment. Eight courses are now approved by the American Physiotherapy Association. The prerequisites for these courses are graduation from an approved school of nursing or from a school of physical education. Through its bureau of appointments, the national chapter is offering a registry service to hospitals and physicians in search of properly prepared Physiotherapy technicians who have had experience in addition to recognized preparation.

All that is accomplished in an hour's treatment may be undone in the other twenty-three hours, if proper attention is not paid to posture of the patient or if the patient is not encouraged to cooperate constantly in the treatment. Many nurses have the impression that it is the orthopedic patient only who requires massage, exercise, heat or other aids of physical therapy. They do not realize that every chronic patient or any acutely ill patient whose period of convalescence extends over weeks and months is a potential orthopedic patient. Keen observation and skilled care on the part of the nurse may obviate the need of Physiotherapy for many patients and considerably lessen the time that it is needed for others.

An arthritic patient needs to be watched very closely to avoid developing deformities. These patients should be encouraged to perform all the active motion possible up to the point of pain.

Patients who have empyema may easily develop spinal curvatures unless the position is watched closely.

Burns are a frequent cause of serious contractures.

Fracture patients also require skilled nursing and keen observation to avoid developing unnecessary handicaps.

Patients who have had a paralytic stroke tend to become contracted in the flexor and abductor muscles. By giving proper support to the extensor and abductor muscles these contractures may be prevented from becoming fixed.

Physical Therapy. Being part of a report on Hospital Standardization by the American College of Surgeons for the year 1929, page 27-28.

Hospitals are giving more attention to physical therapy as a means of hastening recovery and making the end-results of treatment more favorable. This rapid development must be carefully guarded and to this end the following recommendations are submitted:

1. That hospitals carrying on physical therapy have a well-organized department under competent supervision.

The director of the department of physical therapy should be a physician who has had special training in this branch of work, as well as extensive clinical experience. This is essential, not only for the safety of the patient, but the carrying out of scientific treatment.

2. That the department be properly planned and equipped in accordance with present day standards.

A complete physical therapy department embraces massage, hydrotherapy, electrotherapy, heliotherapy and mechanotherapy. The planning of the physical therapy department should have serious consideration. This is now well standardized. Equipment, which should be mostly portable, is also well standardized.

3. That there shall be adequate trained personnel under competent supervision.

The department should have the necessary corps of trained technical staff. Physical therapy technicians or aids require a basic knowledge of anatomy and physiology in order to understand the application and effect of the various types of treatment. Well-trained technicians are invaluable, not only in carrying out treatment ordered, but in observing and reporting symptoms and reactions to treatment. They should always be under the supervision of a medical director. Technicians or aids are generally trained in a well organized department where there is a sufficient volume of work to provide the necessary experience or apprenticeship under proper direction.

4. That a comprehensive system of records be available in the department and filed in an accessible manner.

These records should include a brief summary of the history of the patient with provisional diagnosis, description of treatment as to type and quantity, report of progress while under treatment, and finally, a detailed description of condition on discharge from the department.

5. That a definite procedure be established for the reception, treatment, and discharge of the patient.

This department should be chiefly for referred patients. It is important that the medical director have full authority in regard to treatment, inasmuch as physical therapy has become an intricate specialty in the last few years, and all doctors practicing medicine today are not sufficiently familiar with the various forms of therapy to assume the entire responsibility of prescribing the most desirable type of treatment. Each patient should be thoroughly examined, and diagnosis confirmed before treatment is commenced. No patient should be kept under treatment longer than is necessary.

6. That as far as possible there be periodic analysis of the work of the department to determine the results.

The limitations of the various forms of treatment must be carefully guarded at all times. Through proper evaluation of the results obtained from this form of therapy and the collecting of scientific data, the real worth of these various kinds of therapies may be better established.

The future success in the scientific development and use of physical therapy lies in the careful observance of the above recommendations. Only in this manner can the different forms of treatment be safely, effectively and intelligently applied and accurate results determined.

Treatment of Parkinson's Syndrome With Fever Produced by Baths. By P. S. Pouppirt, M.D., San Francisco, in Cal. & West. Med., 31:3:192-195: Sept., 1929.

The baths were given in an ordinary continuous bath-tub. The mouth temperature as taken with a regular thermometer, the rectal temperature as obtained by the thermocouple, and the pulse were recorded every five minutes. The temperature of the bath water was ordinarily started at 110 degrees F., although in special cases lower temperatures were used. The rapid rise in the mouth and rectal temperatures were allowed to continue their upward course until a point was reached about one and a half degrees under that which had been decided upon as the desired temperature. In comparing the mouth and rectal temperatures there is ordinarily a close correlation, but at times, especially in noncooperative patients, the recorded mouth temperature may be much lower than the rectal temperature. The patient's fever is maintained for a period of about 45 minutes at from 104 to 105 degrees F., even higher at times.

The number of baths varies from fourteen to twice that number without interruption, depending upon the needs of the case. At times the situation seems to demand a treatment every other day, or even every third day. No complications of importance were noted in a series of 900 baths given to patients with a variety of neurological conditions.

SUMMARY

The encephalitic patient (Parkinson type) stands hyperpyrexia produced by baths very well.

Presenting signs and symptoms, such as tremor, spasticity, ocular crises, pains in the muscles, and feeling of stiffness, are helped in nearly every case, and in a few cases are entirely done away with.

The health of the individual as a whole is improved. His weight is increased; he has a feeling of well being, and less depression.

These treatments are particularly useful as an adjunct in the reeducation of patients with very severe sequelae of encephalitis. It occasionally enables them to be put back to useful employment where other measures have entirely failed.

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